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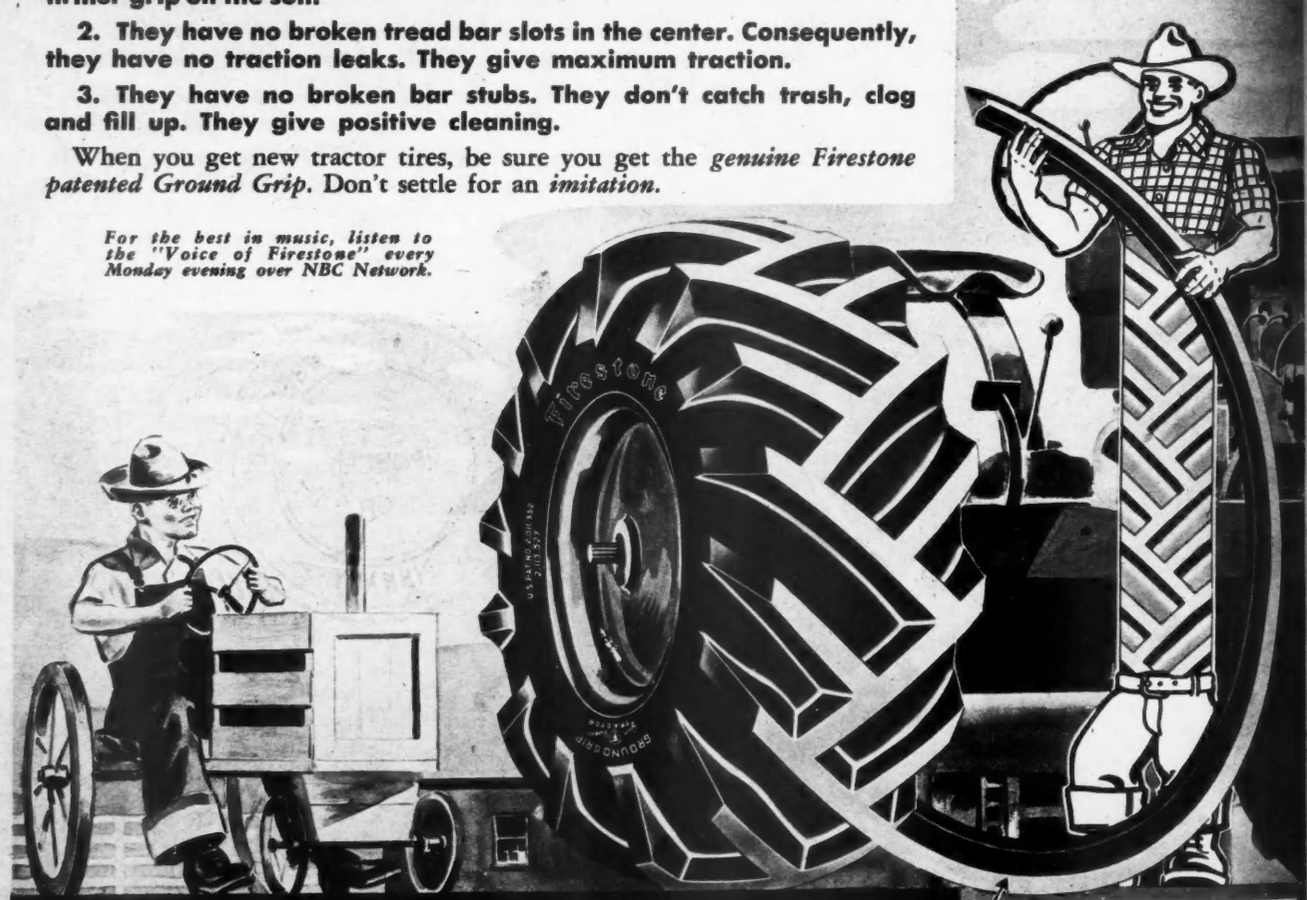

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LETTERS TO THE EDITOR

Horse Apples

Dear Sir:

I am wanting a few trees of some of the old time fruit. Can you give me the names of some nurseries that carry some of the old-time fruit? I want ungrafted trees such as horse apples and other varieties.

Thanking you for any information you can give me.

Cobb, Kentucky S. E. Sizemore

The Horse Apple had friends, as is indicated by this letter, but it hasn't been popular. The Horse Apple, or Haas as it is sometimes known, once was widely planted in America because of its early bearing, thriftiness, hardiness, and productiveness in tree. The variety originated almost three-quarters of a century ago on the farm of Gabriel Cerre, St. Louis, Missouri. Were it not for the poor quality of the fruit, the tree might have been a universal favorite.

If you want a tree to run true to variety, it would necessarily have to be a grafted or budded tree. Seedlings do not run true to variety. If any reader has a Horse Apple variety, please communicate with Mr. Sizemore.

Andrew Jackson Downing, renowned horticulturist, wrote a century ago his thoughts on old varieties: "While we admit that, in the common mode of propagation, varieties are constantly liable to decay or become comparatively worthless, we believe that this is owing not to natural limits set upon the duration of a variety; that it does not depend on the longevity of the parent tree; but upon the care with which the sort is propagated, and the nature of the climate or soil where the tree is grown."—Editor.

Unripe Fruit

Gentlemen:

What Mr. W. S. Campfield says about green Grimes Golden in the February issue of *American Fruit Grower*, I would like to say about most of the fruit that is bought from stores and fruit markets.

It is green, unripe fruit. It tastes green and reacts green. The beautiful yellow, or deep red, or blush tint is but a first class deception. The peel is generally tough as whitleather and a bite of the fleshy portion is not very different from a bite of alum.

When swallowed, one can bank on a period of disagreeable belching and stomach churning. When allowed to lie around until it has passed the alum stage, and so that it contracts a measure of ripe flavored sweetness, the average store apple develops dried out spots that are very similar to dry rot in wood.

Apples are not alone in this catalog. Oranges, peaches, bananas, etc., are all picked and packed so green that the average user never knows what ripe or even nearly ripe fruit tastes like.

I realize that these painted storehouses of indigestion have been developed for the marketing system and have been made to look ripe while still dead green, so they can be picked and kept in storage and sold on the merits of skin beauty, but when I read the catalog advertisements and look at pictures showing beautiful red apples that "turn to this beautiful red a month or six weeks before ripening" I just think "stomach-ache" and turn the page.

Anderson, Ind. Chas. W. Landes

Is it possible that our pressure testers are leading us astray?—Ed.

Picture-Study Method

Gentlemen:

I was so impressed with the "Identifying Insect Injuries" article by Eldon S. Banta in the February issue of *American Fruit Grower* that I thought it would be well to let you know about it. Seems to me this kind of an article enables most of us to get the greatest amount of good out of our magazine. I refer to the excellent pictures in addition to the well written explanations of them.

This picture-study method, I feel, eliminates so much guess work. I hope we have more of this kind of article.

Charleroi, Pa. G. H. Brumbaugh

We are glad to know that our readers share our enthusiasm for the picture-study method article. In the future, we shall endeavor to have more of this type article.—Ed.

Basic and Acid Lead Arsenate

Gentlemen:

Round Table Discussions are interesting. How many of your subscribers know the difference between Basic and Acid Lead Arsenate?

Elizabeth, Pa. E. P. VanKirk

Mr. VanKirk asks an interesting question. He is undoubtedly referring to the Round Table Discussion on the subject in the October, 1944 issue of American Fruit Grower. There are a number of arsenates of lead in existence, but that most commonly employed for insecticidal purposes in composition approximates to the diplumbic hydrogen arsenate $PbHAsO_4$. The predominant constituent of the commercial lead arsenates described in this country as "acid" lead arsenates is of this comparatively stable compound which is almost insoluble in water. Although the compound contains the heavy lead atom, the precipitate remains well in suspension.

Lead arsenates of a more basic nature have been used in the United States under the name of neutral or "basic" lead arsenates.—Ed.

Hobby Grower

Dear Sir:

Being a printer, with about 250 fruit trees well taken care of as a side hobby, it is my opinion that the average user of apples knows little about the fruit.

As I dispose of my crops at my home, I am considering placing a copy like the one below on each unit of fruit.

May I have your opinion of the idea?

Tiffin, Ohio Henry B. Ward

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We think your idea a good one, Mr. Ward, and know your customers will appreciate such a service.—Ed.

Iron for Soil

Gentlemen:

I like your magazine very much. If possible could you answer this question for me.

Is ground up iron good to put on the soil for fruit trees? If so, how much should be used for each tree? This iron is in the form of fine shavings.

Pittsburg, Kansas Ann Howard

The iron probably has no important effect as it is not in the form needed for absorption. It would be rare to find a fruit soil with insufficient iron. There has been no improvement in the color of fruit noted from this practice.—Ed.

Long-Time Fruit Grower

I have enjoyed reading those Letters to the Editor, as I always have been interested in fruit growing. I grew up in Monroe and Montgomery County, Iowa, when fruit was a luxury and we, as small boys, got very little of it. I made a vow that when I grew to manhood that was one thing I would have plenty of. I farmed in Iowa until 1901 and then moved to Okanogan County, Washington. I filed a government homestead and started to make a home, and you can imagine how we worked. We built a log house, went to work, and soon had a nice home. Then I broke some sod and planted my first fruit trees. Had some nice fruit and to date have planted three small orchards, one in Oregon and two in Washington and have eaten nice fruit from all of them. At present, at the age of 79, I am still trying to carry on.

Five years ago I bought the place we own now. The neighbors said we were foolish, as we could probably raise nothing on the land. I told them to wait and see, and today we have raised more garden stuff than we could consume. But it will not go to waste as there are lots of deserving people who do not have anything. It seems strange to me that so many people go without when it is so easy to raise.

Oroville, Washington O. N. Lawrence

We enjoyed hearing about your early fruit growing days, and must say that you are still doing a grand job today.—Ed.

Apple Consumption

Dear Sir:

When fruit of all kinds is selling as high as it does now, there is bound to be a wild scramble to set as much of all kinds as we can get hold of. Recently a nurseryman said he was offering $250 per thousand for gooseberries, and all other fruits of value are only just behind.

Inasmuch as I made most of my plantings just after the last war, paying sixty-five cents for apples and eighty-five for pears, it makes one wonder what will be the conditions twenty years from now. Can our consuming public take care of the many orchards just coming into bearing and the thousands of acres bound to be set in the next ten years?

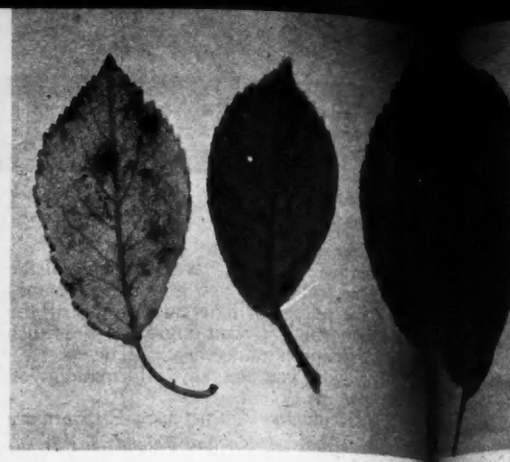
At the winter apple show at Rochester I found that many growers, like myself, were having the unique experience of retailing much of their fruit this season. Instead of packing this fruit in any old haphazard manner and shoving it onto the wholesale market, much of it has been graded into three grades and found a ready sale right under our noses. My personal observations correspond with those of many others on the varieties. Every apple grower has a pet variety that he likes to grow or eat or

(Continued on page 30)

CAUSES OF PREMATURE DEFOLIATION OF THE SOUR CHERRY

By E. J. RASMUSSEN

MICHIGAN STATE COLLEGE



Sour cherry leaves showing copper injury. Proprietary copper compounds cause less of this type of injury to the foliage than bordeaux.

MANY cherry growers find it difficult to distinguish between foliage injury and premature defoliation resulting from various causes. The more common causes of premature defoliation of the sour cherry are drought, fertilizer treatment, disease injury caused by leaf-spot and cherry yellows, insect injury, and spray treatment.

If these injuries would always occur singly it would not be difficult to tell them apart, but it often happens that more than one kind of injury is present on the foliage at one time. Unless the history of the cultural practices in an orchard is known it may be difficult to diagnose the cause of defoliation.

The different kinds of injury vary in appearance in their development throughout the season. Some of these changes in appearances, which are important in diagnosing the trouble, occur within a few days. For that reason, growers should make frequent inspections of their orchards and become familiar with the various symptoms of the causes of defoliation. Sometimes the appearance of the orchard as a whole, or of an individual tree, is a better indication of a certain kind of injury than the individual leaves. The bronze-colored appearance of an orchard, due to injury caused by some copper compounds, is an example.

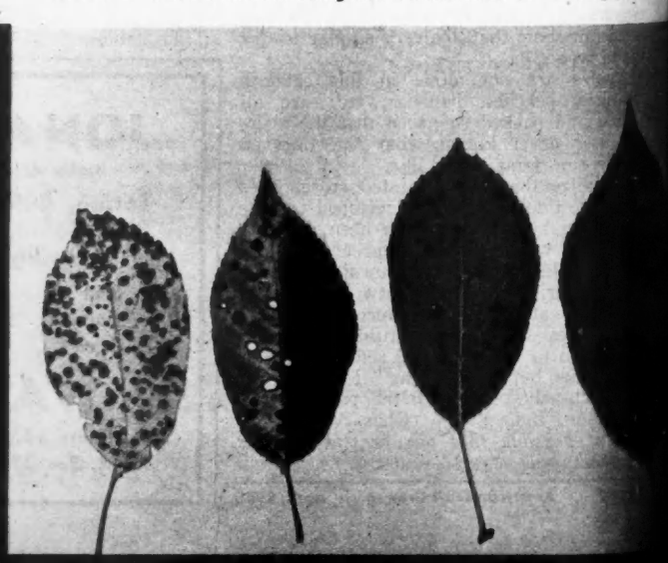
Drought injury, as the name implies, is caused by prolonged periods of dry weather. It is most likely to occur on light or shallow soil and in closely planted orchards. Under mild drought conditions the leaves, particularly those on the inside of the tree, turn yellow and fall. If weather conditions are both dry and hot, wilting of the foliage occurs and some of the leaf tissue may become dried out and turn brown, giving the leaves a scorched appearance.

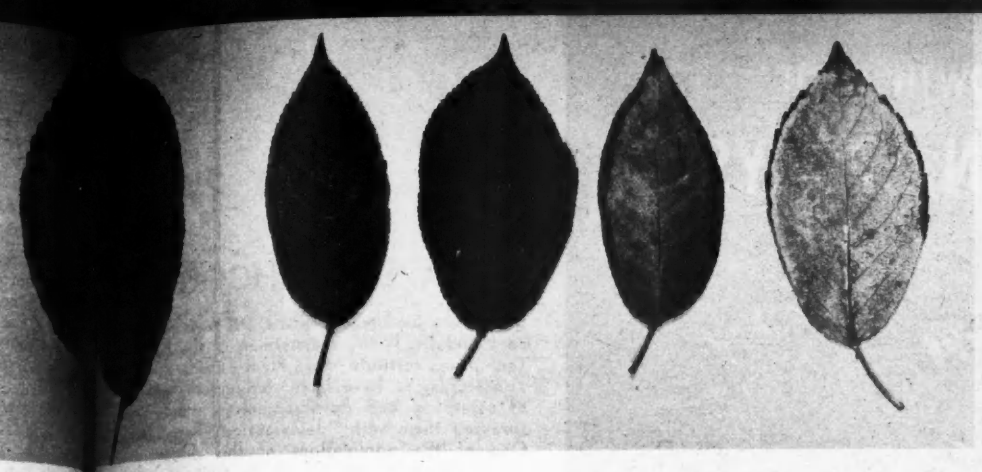
Premature defoliation caused by fertilizer treatment is not common. It is usually the result of too heavy application of an inorganic nitrogenous fertilizer such as Cyanamid applied at the wrong time of the year. Such injury is most likely to occur on light sandy soils when the fertilizer is applied in the spring. The first symptoms of the injury is the browning of the tips of the leaves. Nearly every leaf on a tree will show this characteristic brown tip. As the injury progresses, there is a marginal browning of the leaf from the tip toward the base, and at the same time a yellowing of the leaf tissue from the tip downward in a characteristic "V" outline until the entire leaf has turned yellow. The final stage consists of a light browning of the leaf tissue starting at the base and progressing toward the tip, and then defoliation. Severely injured trees may be nearly defoliated by August.

Leaf-spot, or shot-hole as it is commonly called, is responsible for the greater part of premature defoliation on sour cherry. It is caused by a fungous disease. The fungus lives over winter in the old leaves on the ground. Spores develop in these old leaves in early spring, and if favorable weather occurs the first spores are discharged from the old leaves about the time the cherry trees are in bloom. These primary spores may continue to develop and be discharged for a period of about

Pictured below are defoliated leaves from a tree affected by cherry yellows. This is a virus disease and cannot be controlled by spraying.

Leaves showing injury caused by cherry leaf-spot. Copper fungicides are more effective in controlling this disease than sulfur fungicides.





This injury is caused by Cyanamid (a nitrogen fertilizer) applied at the wrong time of the year. Note the brown tip on each leaf.

two months, depending on weather conditions.

The first indication of leaf-spot infection is the appearance of small purple, circular spots on the leaves. Small pimples can frequently be observed on the under side of the leaves in the center of these purple spots. Cream-colored masses of spores, which appear when dry as white powdery tufts, exude from these pimples. The purple spots enlarge in size to about ⅛ inch in diameter and later turn brown. If the leaf is growing, the healthy tissue enlarges faster than the brown dead areas. This results in the brown areas falling out, giving the leaf a shot-hole appearance. Individual holes are circular with smooth or ragged edges. When several spots coalesce or run together an irregular shaped hole is formed. Sometimes leaf-spot infection occurs only on one side of the mid-rib. The infected half turns yellow, while the other half of the leaf remains green. If the disease remains active the leaves turn yellow and fall off. There may be several waves of infection and defoliation during the season, and trees may be partially or completely defoliated, depending on weather conditions and spray treatments. Unlike cherry yellows, injury and defoliation caused by leaf-spot will likely occur somewhat uniformly throughout an orchard if all trees have had the same spray treatment.

The amount of damage caused by leaf-spot will depend upon the amount of defoliation and the time of the year at which it occurred. Trees seriously defoliated before harvest fail to ripen their fruit normally and produce a low quality crop. If defoliation occurs early for several consecutive years the trees become subject to winter injury and are likely to be killed by low-winter temperatures.

Leaf-spot can be controlled by spraying. A four-spray program, the first applied when most of the petals have fallen, a second two weeks after petal fall, a third four weeks after petal fall, and a fourth immediately after the crop is harvested is recommended in Michigan. Copper fungicides are more effective in controlling leaf-spot than sulfur materials. The development and intro-

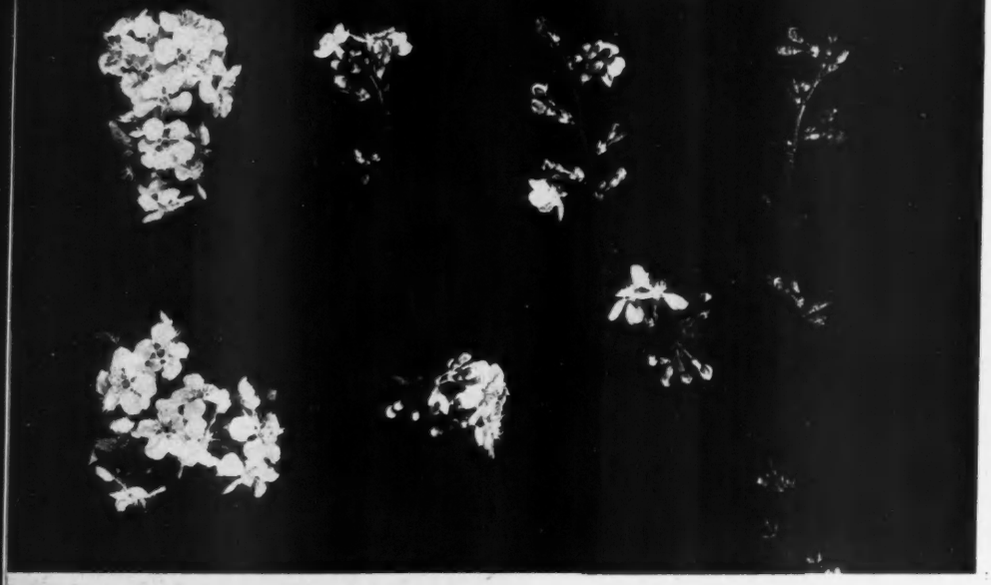
(Continued on page 22)

(Above) A healthy productive Montmorency sour cherry tree. Compare with photo below.

(Above) Non-productive Montmorency sour cherry tree defoliated and stunted by cherry yellows.

This row of trees (below left) shows defoliation caused by cherry leaf-spot. On July 8, the trees in the photograph (below right) also showed heavy cherry leaf-spot infection. They were given two applications of a proprietary copper material, which retarded the development of leaf-spot, and the leaves, although showing leaf-spot infection, remained on the trees until frost.

RETARDING BUD GROWTH WITH DELAYED ACTION SPRAYS



Above—Montmorency cherry showing the influence of concentration of potassium a-naphthaleneacetate and the time of applying the spray. (left to right) control, 0, 02, 0.04, and 0.08 per cent applied July 21, 1941. Photographed April 30, 1942.

Left—Stayman Winesap apple. Left, control. Right, sprayed July 22 with 0.08 percent solution of potassium naphthaleneacetate. Photographed April 30.

Below—Rhode Island Greening apple sprayed July 21 with (left to right) control, 0.02, 0.04, and 0.08 percent solutions of potassium naphthaleneacetate. Photographed April 22.

By A. E. HITCHCOCK

During the past several years, Dr. A. E. Hitchcock and Dr. P. W. Zimmerman of the Boyce Thompson Institute for Plant Research at Yonkers, N. Y., have been studying the effect of retarding bud development in plants by spraying them with "delay-action" hormones. One of the applications of this discovery, which should be of interest to fruit growers is the holding back of flowering and fruit formation until frost danger is over.—Editors.

THE substances which have been referred to frequently as plant hormones were at first thought to stimulate the growth of plants. Except for a few cases of localized stimulation, these substances as a class are excellent inhibitors, particularly with respect to their retarding influence on buds. Growers have recognized the need for regulating the growth of plants for many different purposes. Delaying growth to escape damage by frost is one of the most important. Staggering the flowering or the fruiting of ornamental and commercial varieties are other important examples which apply to temperate zones but may prove applicable in the tropics. In breeding work, the regulated growth of flower buds would also be of special importance. While the use of the treatments applied to fruit trees may have a limited practical application at present, it is believed that some modification of this and other methods may eventually extend the practical uses of substances belonging to the plant hormone group.

The so-called delayed action spray for retarding the growth of buds on fruit trees is applied in late summer or in the autumn before the buds go into their dormant winter rest period. At this stage of development the buds are not fully mature. This procedure is in contrast to that whereby sprays are applied in the spring after the dormant period is over and buds are ready to grow. Thus far the use of sprays in the spring has proved unsatisfactory for retarding the growth of buds, whereas the same sprays applied in late summer have resulted in a delay of one to two weeks for flower buds and even a longer period for leaf buds which are more sensitive. Thus in the following spring the treated branches presented the unusual spectacle of being in full bloom alongside of leafed-out control branches which had undergone complete petal fall.

(Continued on page 28)

QUALITY-PLUS FRUIT IN THE STANLEY FULTON ORCHARD

By ELDON S. BANTA

Stanley Fulton and his new 110,000 bushel cold storage and packing house built in 1944.

HAD Stanley Fulton followed in the original footsteps of his father this story could never have been written. His father was a dairyman and graduate of Michigan State College. Stanley moved from Detroit where he was born, to southern Illinois with his father. From the Illinois farm the family moved to the rich lands of Kansas. Soon a bit of luck was to come that was to change the life of young Stanley Fulton. It was destined to make a fruit grower of this dairyman's son.

In 1900 one of Stanley's uncles bought land in West Virginia and planted it to peaches. Good peaches were at the time selling for $2.50 and $3.00 a bushel, an encouraging price. His father sold the Kansas farm and moved to West Virginia to get in on the peach deal with his uncle. Stanley came along and he too became interested in the fruit game. From 1919 to 1925 Stanley Fulton managed orchards for American Fruit Growers Inc., a large orchard-owning and marketing company. The company has since discontinued much of its orchard ownership and has expanded more in the handling of orchard supplies.

In 1937 Stanley bought his first orchard, a 200 acre apple orchard near Hancock, Maryland, for $12,500. For the ten years previous to this he had operated his father's orchards in the same vicinity. His father had sold off all but 125 acres of his orchard by 1937 and Stanley began making his own orchard investments. Expansion of the Fulton Orchards continued from this time until 1941 when he added the last of five orchards, bringing the total acreage to 800 acres of apples and peaches. In addition to these he leases another orchard just east of Hancock, Maryland.

Thoroughness of spraying, good systems of culture, fair treatment of workers, and a general over-all efficiency of operations and management, have been largely responsible for the successful development of the Fulton Orchards. To have a large commercial enterprise as this grow and develop into an efficient and smooth-running organization requires a steady, alert, and understanding mind in control. These are the qualities exhibited by Stanley Fulton, this outstanding Appalachian fruit grower.

The newest addition to the Fulton enterprise is the modern cold storage and packing house constructed in 1944. Holding about 110,000 bushels, the cold storage proper is 100 feet by 120 feet and is three stories high. Attached to this is the office building 20 feet by 40 feet. Into this room come the calls for shipments of from 1 to 8 cars of apples a week from October to April. The entire building is constructed of brick with concrete floors.

The lower floor is composed of a refrigerated storage, compressor, and heating unit rooms. On the rear of the building is a rail loading platform. Practically all of Mr. Fulton's winter apples are shipped from this

(Continued on page 24)

The two 6 x 6 compressors used to refrigerate the 110,000 bushel Fulton cold storage.

THE ORCHARD SOIL

By
GEORGE D. SCARSETH
Director of Research, American Farm Research Administration

These trees (upper right) have been well mulched. The well-developed, seven-year-old apple tree (above) has been cultivated each year during the summer months and the soil seeded to rye each fall for a winter cover crop ever since the tree was first set out. The smaller tree (below) was set out at the same time. After the first year the land was seeded to grass. The only cultivation given to the tree since that time has been in a very small area around the tree in the manner of hoeing each year to keep down the weeds. Note growth.

A FRUIT tree has work to do. Much of this work is done in the ground. It is just as important to keep the roots busy every day of the year as it is to have the hired man effectively occupied throughout the year. Whenever any important soil condition is unfavorable the roots will loaf on the job and this loafing will show up in the growth, in the yield, and in the quality of the fruit.

In plain language, what are some of these important soil conditions and how do they affect the work roots have to do? Whenever the soil contains a lot of angleworms one can rest assured that conditions are almost ideal for roots to be doing their most efficient performance. If a soil is too poorly aerated because of tightness or poor drainage, the air (oxygen) supply is deficient and worms would die. Roots would also die because they require oxygen to live just as the angleworm requires oxygen. When the air supply is deficient some microorganisms that can live without free oxygen (anerobic bacteria) will multiply by taking their necessary oxygen from such combined forms as iron oxides (reddish or ferric iron compounds) and leave the iron compounds robbed of their oxygen (bluish color or ferrous iron compounds) which, along with some sulfur gases, are poisonous to roots.

Dry and Wet Soil Conditions

If the soil is too dry, angleworms will not remain in it; neither can a root absorb its plant food nutrients when the soil is dry. The soil that is moist for only a short while after a rain and dries out frequently is a dangerous place for the angleworm and he will not risk his life by venturing into such a soil. Intermittent wet and dry soil likewise handicaps the root from doing its best work because the root can only work when moisture surrounds it, and when the soil is dry the root has to loaf on the job.

Plant food nutrients can pass through the cell walls of the root only when moisture is present to act as the carrier. We thus see that any condition favorable to preventing drouths is helpful, such as maintaining as high an organic matter content as possible and by the use of mulches that keep the soil cooler and, therefore, richer in water.

Cool Soil Temperatures Best

Just as the angleworm requires certain favorable temperatures so do roots because they are living structures requiring similar favorable temperatures. A soil that is bare in the hot summer and low in organic matter will be too hot and dry near the surface for a root just as it would be too hot for the worm. An important benefit derived from good mulches is not only the moisture-saving feature but the shading influence of the mulch in keeping the soil cooler than when unprotected. The cooler soil will be somewhat enriched in moisture in certain hours of the day such as shortly after sunup when the air above the ground is warmer than the soil that was cooled in the night.

Keep Roots Working

Roots cannot rapidly move away from an unfavorable condition in the soil as the worm can; thus, it is most important that everything favorable to the living processes in the root be

(Continued on page 31)

Dr. Merrill is shown here with a Wayne University student, Miss Betty Tuuk, who assisted in the Michigan experiment. The containers with which the experiment is concerned are left to right: the bushel box, regular apple box; the cell-type box, one-half bushel, 96 peaches of approximately 2¼" in diameter; the regular bushel basket, and displayed above, the cell-type box, the 2-lb. consumer package, holding eight peaches of 2¼" to 2½" in diameter.

PLEASING THE CONSUMER

REPORT ON EXPERIMENT TO REDUCE HANDLING LOSSES AND TO IMPROVE THE QUALITY OF MICHIGAN PEACHES

By T. A. MERRILL
Michigan State College

MICHIGAN'S thousands of peach growers are awakening to the possibility of adding appreciably to their cash incomes through the adoption of modernized marketing techniques designed to increase consumption and at the same time reduce damage and waste.

A shipping and marketing experiment, begun in 1943, was continued in 1944 through the cooperation of the Millburg Growers' Exchange, the Michigan Chain Stores Bureau, the Great Atlantic & Pacific Tea Company and the Horticultural Department of Michigan State College. The object was to reduce handling losses and to improve the quality and condition of peaches as they reach the consumer; the means was the use of three types of shipping containers, a consumer package, and the precooling facilities of the Millburg Exchange.

In 1943 the experiment included tests of consumer acceptance of peaches at various stages of ripeness. Due to the scarcity of labor in the producing area, this phase of the experiment was abandoned in 1944. In this connection it should be pointed out, however, that in the 1943 tests the consumer showed an overwhelming preference for the firm ripe peach over the fruit at the hard ripe stage at which it is normally marketed. These results, backed by results of similar tests conducted in Illinois, strongly indicate that the housewife is willing to open her purse more freely to the peach grower the moment he and the distributor can find practical ways and means of putting a firm or tree-ripened peach on the market.

The 1944 experiment, then, was confined to two channels; securing data on handling losses through the use of various containers, and testing consumer acceptance of these containers.

Handling damage, in the form of first and second degree bruise, was checked at the packing house, the A & P warehouse in Detroit, and at the store—clear through to the moment of sale. Girls assigned especially to the task in the stores also checked rate of sale of each container, as well as volume and time of each sale.

All the peaches shipped experimentally were firm ripe—the stage at which the green ground color has changed to lemon-yellow.

The fruit was packed in the standard bushel basket, the Western bushel apple box, and a new, half-bushel cell-type cardboard box. Acceptance of this latter container proved to be one of the surprises of the experiment.

Half of the containers of each type were precooled, at 40 to 45 degrees, for 18 to 24 hours before each shipment from Millburg. Fifty containers of each type were shipped each day except Saturday throughout the two weeks of the experiment.

All shipments were made by truck to Detroit and checked at the A & P warehouse for bruises and temperature (see table), and then sold through retail stores in three different income areas—high, middle and low.

First degree bruises were those known to affect the sale or even cause complete loss of the fruit. Loss in the retail stores from each type of container was almost directly in proportion to the percentage of first degree bruises as found at the warehouse.

From the table it will be seen that no first degree bruises and a much lower percentage of second degree bruises were found in the cell-type box than in either of the other two types of shipping containers. As the loss in the retail store was almost directly proportional to the amount of first degree bruising, this box proved to be definitely a money saver as a shipping container.

Although the percentage of first degree bruising was somewhat less

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Table—Showing Condition of Fruit on Arrival at Warehouse

*PC—Precooled. **NPC—Not precooled.

Container	% of Fruit Bruised		% of Fruit Showing First Degree Bruises		% of Fruit Showing Second Degree Bruises		Temperature of Fruit at Warehouse	
	PC*	NPC**	PC	NPC	PC	NPC	PC	NPC
Cell Box	6.9	18.1	0	0	6.9	18.1	59.3	61.8
Bushel Basket	65.1	70.2	15.2	11.4	49.9	58.8	61.0	64.2
Western Box	42.2	60.4	3.6	10.4	38.6	50.0	58.0	61.3

In the commercial sections of California peach growing, irrigation is a standard practice.

THE CALIFORNIA PEACH INDUSTRY

By E. L. PROEBSTING

University of California

THE California peach industry ranks sixth in acreage of bearing fruits in the state, and third in non-bearing acreage. After a prolonged period of gradually falling acreage, the last two or three years have seen a stabilizing period when new acreage coming into production has slightly exceeded the old orchards being removed. The latest figures available, those for 1943, show 81,349 acres in bearing and 16,503 acres in non-bearing trees. Of these, 42,356 bearing and 11,315 non-bearing acres are clingstone varieties. The peak of planting was reached in 1928, when there were 134,049 acres of bearing peaches in the state. The decline in acreage has been offset by an increased production per acre from about 5 tons twenty years ago to over 10 tons in 1944. The 1944 crop approached a half-million tons (over 20,000,000 bushels) of clingstone varieties and over 300,000 tons of freestone varieties. This constituted over forty percent of the national peach crop of 1944. The estimated canned pack for 1944 reached about 357,000 cases of freestones and 12,311,000 cases of clings on the basis of No. 2½ cans. A high proportion of the canned clings and dried peaches of the United States are produced in California.

The commercial peach areas of the state are largely concentrated in two districts. One, centering about Stanislaus County in the San Joaquin Valley, contains about half of the bearing acreage of clings and nearly seventy percent of the freestones. The other, concentrated largely in Sutter County in the Sacramento Valley, has about forty percent of the cling area and fifteen percent of the freestones. Southern California has some ten percent of the freestone acreage. These districts have in common long summers with almost no rainfall from May to September, rather high midsummer temperatures accompanied by low humidity. Irrigation is required throughout these areas.

The important varieties of clings are all of local origin. They fall naturally into four groups according to season. The early varieties are of minor importance since the practical disappearance of the Tuscan. Two new ones which are being planted in some volume are Shasta and Fortuna. It is expected that these plantings will help extend the canning season and enable the grower partly to equalize his harvesting. The next group is made up of early mid-season varieties, such as Paloro, Peak, and Hauss. Next come the late mid-summers including Gaume, Johnson, and Halford. The Phillips is still the central variety of the late group, but has not been planted extensively in recent years. The Gomes or Stuart and Corona appear promising additions to the late group. The Andora in the early mid-season and Carolyn, Tudor, Sullivan No. 1, and Stanford among the late mid-season also appear to be finding a place. All of these varieties meet in large measure the canners' demand that the fruit ripen evenly, be nearly round, without a ridge along the ventral suture, have sufficiently firm flesh that the edges of halves or segments be sharp and do not give fragmented material to the syrup, and have no red at the pit or through the flesh, so that the juice remains clear.

The California dried peach industry rests mainly on four varieties: Elberta, Muir, Lovell, and Salwey. Other varieties may be dried when the price relation between dried and fresh outlets favors the dried product, but few other sorts have a small enough drying ratio, and make an acceptable enough dried product to be dried on a large scale.

Varieties for fresh fruit are largely standard for the Sacramento and San Joaquin Valley sections, including Florence, Alexander, Fisher, July Elberta, St. John, Rochester, Elberta, J. H. Hale, Fay Elberta, Orange Cling, Rio Oso Gem, Wiley and Levi. Other varieties originated by eastern experiment stations and the United States Department of Agriculture, as well as by the California Experiment Station, are under trial or in small commercial planting, and may supplant some of older sorts.

A different situation exists in the southern California section. The winters are frequently too warm to break the rest period satisfactorily for most standard varieties with heavy budd-drop, straggly blooming and delayed and unsatisfactory leafing-out a consequence. New varieties, of which the Babcock is the best known, have been bred to meet this situation. These varieties do not enter interstate shipments, but supply the local market.

Irrigation is a standard practice in peach orchards throughout the commercial sections. A great deal of research has been conducted on water relations and related cultural practices, and most growers are now following as nearly as possible a schedule that never permits the trees to remain at the permanent wilting point for a protracted period, and does not supply so much water that leaching below the root zone or loss to a water table results. Within these limits, trees function normally.

The majority of growers train their

(Continued on page 35)

● Fruit and foliage must be protected against devitalizing attacks of aphids, red bugs, bud moths and destructive insects. Use Black Leaf 40 economically—in one combined spray.

Spray with Black Leaf 40

Black Leaf 40 is effective, does not harm buds or foliage. Compatible with practically all other spray materials.

BLACK LEAF 155

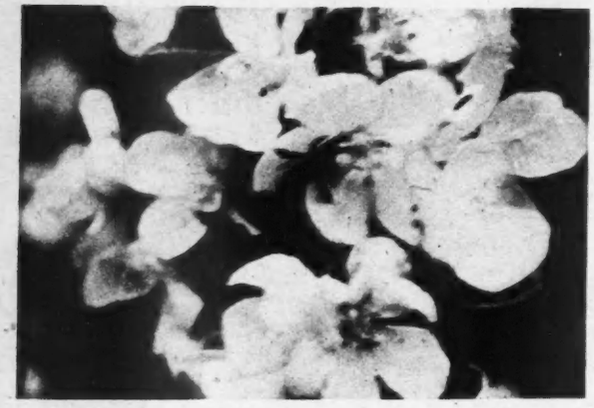
This non-caustic protection for foliage permits the manufacture of more food by the leaves and helps mature fruits of larger size. Black Leaf 155 controls codling moth, aphids, leafhoppers, bud moth, some leaf miners, pear psylla and grape berry moth.

● **Record breaking demands for nicotine products essential in protection of certain food crops have developed — in excess of supplies of raw material available at this time. In view of this we suggest that the grower conserve his nicotine supply for his most important protective sprays of the growing season.** ●

TOBACCO BY-PRODUCTS & CHEMICAL CORP.
INCORPORATED • LOUISVILLE 2, KENTUCKY

LOOK FOR THE LEAF ON THE PACKAGE

BEE POLLINATION OF DELICIOUS



By

R. H. ROBERTS
University of Wisconsin

DELICIOUS is a troublesome variety to get to set in the upper Mississippi Valley. During pollination studies in 1944 an unsuspected factor was noted which appears to be a large item in the frequent poor cropping of this variety. This was not a limited pollen efficiency, as good sets were secured following hand pollination with all of the common orchard varieties grown in Wisconsin. Delicious, as other varieties in this section, does not set fruit with its own power but requires cross pollination. The new factor was of an entirely different nature. It was observed that a peculiarity of the Delicious blossom structure permits honeybees to extract the nectar without pollinating the blossoms. At least this was true in approximately 80 percent of the bee visits this season. This is shown by the illustration. In this picture it will be seen that the bee is beneath the anthers and stigmas.

The filaments upon which the anthers are borne are in a narrow upright cluster permitting a bee to alight on the large spreading petals, collect the nectar, and fly away without having to crawl over the top of the blossom and in so doing touch the pistils and pollinate the flower, if it was carrying foreign pollen. The pistils of the Delicious blossoms are so short that it is also possible for the bees, which are collecting pollen rather than nectar, to make the collection without always striking the stigmas of the pistils and transfer pollen from another variety which it might be carrying.

In contrast to Delicious, varieties such as Duchess, Transparent and Wealthy have widespreading filaments. As a result, the bee alights on the top of the anthers and pistils in 90 to 100 percent of its visits. It was found that there is a high association between the blossom type which affects the position from which the bees extract nectar and the initial set of fruit.

The following figures were secured this year on some of the common varieties, the numbers being the percentage of visits in which the bees crawled over the anthers rather than worked from below them: Delicious, 20.4; Duchess, 100.0; Grimes, 46.9; Jonathan, 76.7; McIntosh, 51.2; Northwestern Greening, 57.0; Rhode Island Greening, 33.3; Snow (Fameuse), 74.2; Transparent, 100.0; Wagner, 100.0; Wealthy, 92.0; Whitney (because of strongly cupped petals), 100.0; Winesap, 62.0; York, 41.7. It was observed that varieties in which the bees made less than 30-40 percent of their visits over the blossoms had less than a commercial crop.

Orchards in which there was a good population of bumblebees had high initial sets. This insect always crawls over the blossom when searching for nectar.

Good initial sets were recorded in orchards where the honeybee population was high. In cases where there was a moderate to poor population, the initial set of Delicious was not good farther than one tree away from the pollen source.

It is understood, of course, that the pollinating of a blossom does not insure setting as this is much affected by vigor of growth and other items. It is also to be borne in mind that the maturing into a fruit of one blossom out of every 10 to 12 in the case of a heavily blossoming tree, results in a full crop.

This report is made merely to call attention to the additional item in the setting of Delicious of the role of blossom structure and bee visitation. Successful natural pollination of Delicious appears to require either bumblebees, a high bee population or very nearby pollinating varieties together with a fairly good honeybee population. This variety needs better pollination conditions than those with a reputation for heavy early sets as Duchess, Transparent and Wealthy.

APS

CONDUCTED IN THE INTERESTS OF THE AMERICAN POMOLOGICAL SOCIETY

VARIETY APPRAISAL COMMITTEE

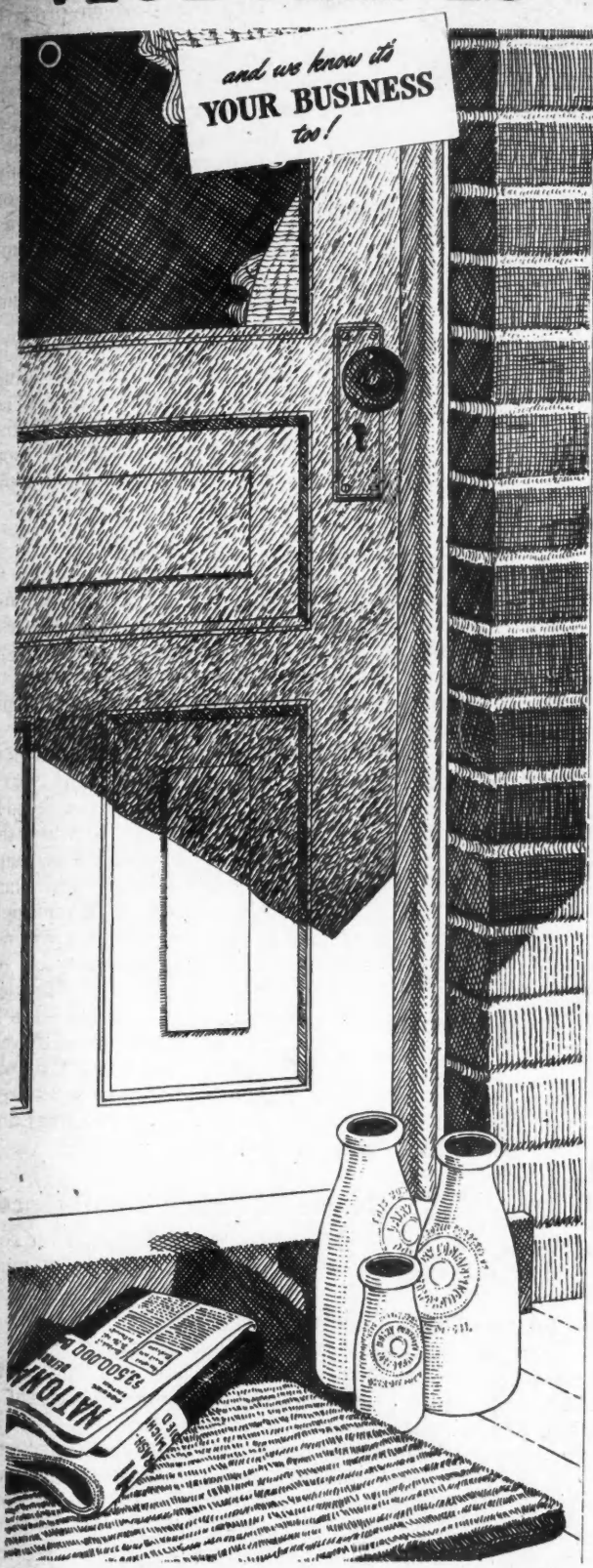
PRESIDENT Stanley Johnston has made a number of contacts for the purpose of learning what horticulturists feel to be appropriate objectives for the American Pomological Society. The evaluation or appraisal of new varieties was proposed by many leading authorities as something that was urgently needed and a project which would naturally fall into the field of work in which the American Pomological Society has long been interested. This matter was discussed at length at a meeting of the officers of the American Pomological Society in Chicago in late January. The ideas there expressed have now crystallized into a plan of action. President Johnston last week appointed John T. Bregger, Clemson, South Carolina, Specialist in Soil Conservation, as Chairman of the Committee to be known as the "Variety Appraisal Committee" of the American Pomological Society. Mr. Bregger is a variety studies enthusiast and expects to organize a nationwide committee. The members of this committee will collect pertinent information about the performance of the varieties in their respective regions. Such information when collected will be the basis for an appraisal of new varieties. These appraisal reports when ready will be published. Orchardists, nurserymen and fruit variety testers will have available an assembled body of facts about new varieties for their guidance.

So great is the need for accurate information about new varieties that it is the general feeling among horticulturists that this new A.P.S. committee will have a significant opportunity for service and be able to make a real contribution to the pomology of America.

We have shown in recent contributions to this page that an enormous number of new fruit varieties have made their debut since 1920. This is a challenging situation which calls for thoughtful study on the part of fruit growers, professional horticulturists, nurserymen and fruit testers. The

(Continued on page 29)

VICTORY IS OUR BUSINESS



WHERE JOBS BEGIN

Every milk bottle at a city door means jobs that put it there—jobs of building up herds, grinding feed, milking, trucking, pasteurizing, bottling, delivering—jobs making milking machines, milk cans, trucks, sterilizing and pasteurizing equipment, bottling machines and bottles.

And the thing that makes these jobs is the fact that there are *customers*, like the family that lives behind this door, who desire to buy milk and cream and can afford to pay for it.

If it weren't for this demand, and this purchasing power, there wouldn't be much use of a farmer's keeping more than one cow. And there wouldn't be much use, then, of making any of the equipment used to produce milk in quantity, process it and get it to the city man's door. A lot of folks would be out of jobs.

It works just the same the other way around, too. If farmers and other customers didn't want what the city man manufactures, or couldn't buy these things, then the manufacturer, his employes and many others would be out of work.

That's the way it's always been and always will be. It's the demand for, and the ability to buy, food and clothing, houses and fuel, transportation and entertainment and all kinds of other things, that make work for people.

Farmer, merchant or manufacturer—*any* employer—must have the opportunity to supply a want before he can provide a job.

That's how jobs begin.

We have to remember this when some folks talk about "creating" jobs.

Jobs aren't *made*. They *grow*—

In the carefully cultivated soil of human needs.

GENERAL MOTORS

CHEVROLET • PONTIAC • OLDSMOBILE • BUICK • CADILLAC • FISHER BODY
GMC TRUCK & COACH • FRIGIDAIRE • DELCO APPLIANCE

Sunday Afternoon—NBC Network—General Motors Symphony of the Air

NATIONWIDE NEWS

Council Underway

FROM THE OFFICE of acting secretary R. W. Gray comes word that many extra copies of the official report of the Chicago meeting are being requested by interested parties. This is encouraging to the newly organized U.S. Horticultural Council.

Marvin H. Walker, acting president of the Council, has been in Washington conferring with government officials. Since the permanent Council is to work with and through government officials and agencies, Mr. Walker obtained those facts essential to the workability of the organization. These facts have aided in directing the policies of the permanent organization which was organized in Sacramento, California, March 29.

DDT for Experiments

A LIMITED QUANTITY of DDT, the war-developed insect killer, has been released to DDT producers for distribution for agricultural and other civilian experimentation, the War Production Board reports. Formerly requests for DDT for research work required application to WPB for individual allocations of the chemical. The material can now be obtained directly from DDT producers without further permission from WPB. In releasing the material for experimentation, WPB's Office of Civilian Requirements and the War Food Administration instructed that DDT producers in distributing the chemical give consideration to work carried out under the supervision of experienced investigators, aimed at determining the suitability of the chemical for agricultural and other civilian uses.

Fewer Tractors in '45

LAST YEAR farmers received around 180,000 wheel tractors, including 30,000 authorized but not completed the year before. Prospects for this year indicate only 150,000 to 160,000 tractors for farmers this year.

Military requirements for crawler tractors are high too, so the supply won't be any higher and perhaps will be smaller than in 1943-44, reports the U. S. Department of Agriculture.

Comprehensive Tree Census

THE Department of Agriculture last made a detailed census of apple trees in the United States in 1928, showing the number of trees by counties, varieties and ages. Since that time, the industry has had no data on which it could intelligently plan, or forecast production trends. Inadequate as a basis for industry planning is the regular five-year census, which merely shows the number of apple trees in the country.

The Bureau of Agricultural Economics is being urged by the National Apple Institute to undertake a detailed survey to supplement the agricultural census now being made. The N.A.I. feels that it is vitally important, as we emerge from the war, to have this information as a basis for sound planning for the future.

Re-elects Officers

CALIFORNIA wine growers, at a proxy election held in San Francisco in March, chose Herman L. Wente of Livermore to serve a third year as president of their Wine Institute. Absentee voting was used when the regular annual membership meeting was cancelled to cooperate with the government's wartime anti-convention campaign.

Other officers re-elected to serve during 1945 were: J. B. Cella of Fresno; first vice-president; John B. Ellena of Etiwanda, second vice-president; Edmund A. Rossi of Asti, third vice-president; Louis Petri of Forestville, treasurer; and H. A. Caddow of San Francisco, secretary-manager. A. R. Morrow of San Francisco was re-elected chairman of the Board of Directors.

Postwar Price Policies

A SERIES of cash awards for suggestions on constructive postwar price policies for agriculture, including any needed changes in the present parity price formula, was announced recently by the American Farm Economic Association.

The awards, which total $12,500, will be made from a special fund made available to the association for this purpose. In addition to three major awards of $5,000, $2,500, and $1,250, there are fifteen awards of $250 each.

Any citizen of the United States is eligible to compete for the awards, which will be made on the basis of practical contributions to the solution of agricultural price problems.

Information about the awards, entries for which must be in by July 15, 1945, can be secured from Dr. Asher Hobson, secretary-treasurer of the American Farm Economic Association, College of Agriculture, University of Wisconsin, Madison, Wis.

Rust Prevention

SINCE MOST MACHINERY rusts rather than wears out, a newly-developed compound which protects machinery for eight months will undoubtedly prove useful to the grower.

The compound can be sprayed on with a power paint sprayer or with a common tin household sprayer enabling it to cover material not easily reached with a paint brush, rag or dauber. Instead of floating away when moisture is present, the compound has such an affinity for metal that it remains under the oil, thus protecting the metal.

This new treatment will probably replace such old methods as using crank case oil, and gear grease. The new compound may not be on the market in all districts but will soon be for sale by most major oil companies.

Prospects for 1945

SUPPLIES OF ALL FRUITS for civilians in 1945 may be a little less than in 1944. Domestic production of deciduous fruits is not likely to equal last year's exceptional crops, but the large January 1 stocks of apples and pears may offset in part the possible decrease in this year's crops. The citrus supplies may be also as large as last year, despite the Florida losses. Imports and shipments from insular areas, which are principally bananas, canned pineapple and pineapple juice, probably will not increase very much because of restricted ocean shipping facilities. Supplies remaining from the 1944-45 pack of canned fruits are relatively small. It is safe to assume that war requirements will continue very large, no matter what happens in the European phase of the war.

National Peach Conference

THE GENERAL theme of the conference of the National Peach Council was "riper peaches to market faster." The conference, held in St. Louis, in February was represented by 20 of the leading peach growing states which produce about 86 percent of the nation's peach crop.

The conference reaffirmed the Council's desire to have ceiling prices removed from so perishable a product as peaches. Growers reported good prospects for the 1945 crop thus far.

New varieties having real commercial merit were discussed. These included Dixigold, Dixigem and Red Haven. Precooling immediately after harvest and methods of marketing ripe peaches were other sources of timely information to peach growers.

Stands Shock of Braking 2-Mile Drops

Our bomber crews have learned a lesson the hard way.

It's not enough to bail out. Before pulling the rip cord, they've got to drop like a rock, sometimes for miles, to evade enemy planes that try to pick them off like clay pigeons.

Then, as the earth hurtles up to meet them, the ring is yanked and . . . WHAM! . . . with a jerk the big umbrella mushrooms out, pulls them up short, lets them down easy.

In that moment of impact, terrific stress goes on harness buckles and hardware. That's why they always contain Nickel—the tough metal that gives alloys high resistance to shock.

. . . just as it stands up under everyday shock

Tools of all kinds, particularly those that must take a daily beating, rely on Nickel to help them stand up under sudden impact. In this, and many other ways, versatile Nickel is your "unseen friend". . . one of the things that serves you every day . . . like the tubes in your radio or the spark plugs in your car.

The International Nickel Company, Inc.

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International Nickel—world's largest miners, smelters and refiners of Nickel and Platinum metals . . . producers of INCO Nickel Alloys, including MONEL and INCONEL.

CUT MORE WOOD TO CUT THE PAPER SHORTAGE

STATE NEWS

TENNESSEE—The Tennessee State Horticultural Society held a most successful meeting in Nashville in January.

Paul B. Conley of Alamo was elected President for the ensuing year. Conley opened some eyes at our meeting last year when he outlined his cultural program which accounted for twelve successive crops of peaches, some lighter than others, but no near-failures.

PAUL B. CONLEY

Conley graduated from the University of Tennessee in the Class of '23, and started his orchard in 1928 while he was teaching in his home county of Crockett. He later became a County School Supervisor, but kept his orchard expanding gradually. Although his present seventy acres is still a side-line, Conley says it is the "main-line" financially.

A score of varieties of peaches gives an almost continuous supply over a five-to-six week period, and, to customers over a 25-mile radius. Conley's is the place for peaches. When his Transparents are "on" he gets a truckload off about the first of June to "prime" the Cincinnati market.

Harry Wallace, Knoxville, Joe D. Peay, Goodlettsville, and Thomas Anderson, Toone, were elected Vice-Presidents for East, Middle and West Tennessee respectively. All are hard-working, full-time fruit growers, and, with Professor G. M. Bentley, Knoxville, who was re-elected Secretary-Treasurer, make an official staff of which any horticultural society might well be proud.—*A. N. Pratt, State Horticulturist, Nashville.*

INDIANA—Reports from various sections indicate that the peach crop has come up-to-date without any damage, although low temperatures were reported from some of the southern sections. Ferd Bolten, Linton, Indiana, reported recently that his locality was still in good shape.

Much interest has been shown at meetings in the strawberry areas. Growers, although hard hit for plants, report sufficient plants for their own use and many will put patches on the best ground they have for plants for next year. They are also planning future plantings, and cover crops will be plowed down in areas where the practice of soil building has not been followed. Patches for this year are very spotted. The new variety, Tennessee Shipper, is coming in for a lot of discussion and when plants are available, it might be the shipping variety. It has been reported to be a well-colored, firm, and a good yielding variety under Indiana conditions. —*K. I. Fawcett, Sec'y, Lafayette.*

MARYLAND—At the Annual State Meeting an economist told fruit growers that they would have three periods of change following the war. First, would come a period of reconversion followed by a time of heavy spending and then we may go either into solid prosperity or depression, depending upon several factors. He suggested getting debts paid off and loans scaled down and converted to short-term loans. Many growers are putting money into soil improvement and have a cash nest-egg set aside. It is not a bad plan to set aside sufficient cash reserve to run the orchard over a period of one or two years, as there may be lean years ahead, until we return to normalcy.

There was grim determination that we would really prune the orchard this winter and try to get the trees in shape for thorough spray coverage to knock out codling moth. The weather was such that few orchards were pruned as desired. If the job was not done as we would like, there is still hope if extra care is exercised, to spray thoroughly, at the proper time, and with the proper material.

According to grower reports from the Cumberland-Shenandoah area the fruit buds are not too plentiful on apples but we will know more about that by midsummer. The winter snows and rains have put considerable moisture into the ground and this may improve the chances of a crop in spite of the devitalized condition of the trees following the 1944 drought.—*A. F. Vierheller, Extension Horticulturist, College Park.*

NEW YORK—Severe damage from mice and rabbits is becoming apparent in New York State as the snow recedes after one of the hardest winters in history. Very little pruning has been done due to shortage of labor and deep snow.

Apple holdings in storage are somewhat higher than average, but moving out rapidly at present. Most growers managed to market the bulk of their 1944 crop at good prices so will finish up with a prosperous season.

The pear bud seems to be light in this area, apples, fair, and cherries somewhat lighter than last year.

Codling moth was more severe than usual in certain areas and growers are making plans to do an outstanding job of spraying during 1945. All are looking forward to the time when better spray materials will become available. A great deal of interest is also being shown in plans for more efficient spraying equipment.—*Horace M. Putnam, Assistant Sec'y, Lyons.*

MASSACHUSETTS—Snowfall was heavy this past winter, and a warm period the latter part of February still left plenty of snow-cover and pruning was somewhat delayed. On March 1 it seemed that there is a good prospect for a better than average peach crop in this state. The lowest official temperature recorded at Amherst was -10° F. on January 25. As long as temperatures go no lower than -15° F., fruit bud killing is not usually serious. The continuous snow-cover has furnished good protection to small fruits and has also caused less deep freezing of the soil than often encountered. Growers should inspect orchards for mouse and rabbit injury which may be more extensive than during a winter with less snowfall.

Professor W. D. Whitcomb cautions growers to control San Jose scale this spring. Outbreaks in Massachusetts have been sporadic and the present infestations may be temporary, but wherever present an outbreak should be checked by applying a dormant or delayed dormant oil spray containing 2 or 3% actual oil.

The 1945 apple and peach spray charts are available to growers. These charts are intended to furnish general recommendations for the state as a whole and were prepared by the Departments of Pomology, Entomology, and Botany, Massachusetts State College. Each winter these charts are revised in the light of new information from experimental tests.

Strawberry growers are becoming more concerned with the strawberry cyclamen mite. Professor A. P. French reports that this pest is becoming increasingly prevalent in Massachusetts strawberry plantations. This mite is very small and lives over winter on the crown and feeds mostly among the young leaves in the growing point and in the unopened flower buds. Infested plants are dwarfed, unproductive, and have crumpled, deformed leaves. The only known control for this pest is a high temperature water treatment of plants and isolation of new plantings. Of course, only mite-free plants should be used.—*Lawrence Southwick, Mass. State College.*

KENTUCKY—Strawberries following corn is not a good farm practice in Kentucky. Last week, while working in our commercial strawberry area, many growers complained about having their new berry field last Spring, ruined by ants working on their berry plants. Incidentally, the trouble was not caused by ants, but by aphis or plant lice on the roots of the strawberry plant. No doubt, however, the ants probably picked up the lice and dragged them down to the tender berry roots where the lice could feed. Then in turn, the ants feed on the secretion from the body of the aphis.

In Kentucky, we like to have strawberries follow tobacco, for this automatically prevents aphis or lice. Potatoes, tomatoes, sweet potatoes, or any truck crop is all right for the crop ahead of berry planting.

There is still time to broadcast 500-lb. per acre of 20% superphosphate on top of your strawberry row if you plan to pick in May. It may increase your yield several crates per acre. At any rate, it will not do any harm.—*W. W. Magill, Sec'y-Treas., Lexington.*

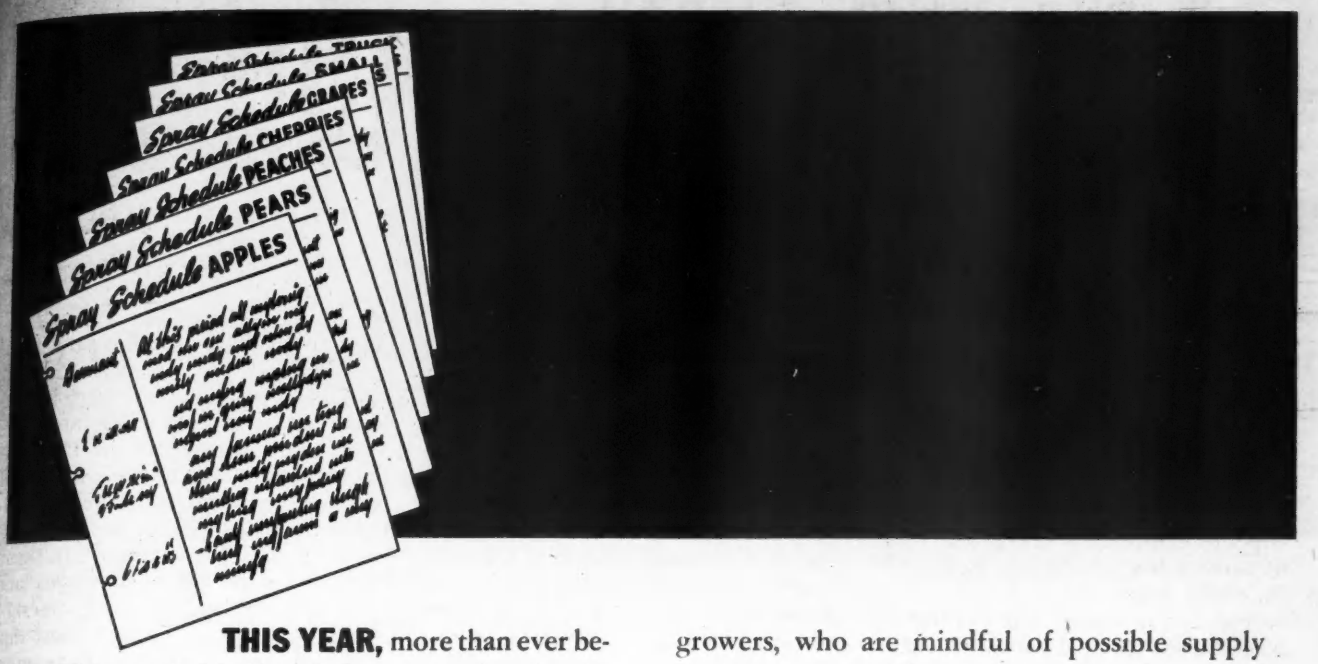
KANSAS—The annual meeting of the Kansas State Horticultural Society scheduled for February at Manhattan, Kansas was cancelled in compliance with request from the Office of Defense Transportation.

We gladly bow to this request if in any small way it will quicken the end of the war and help to bring about the world peace. So far as our records show, this is the first time since 1869 (the date of the organization of the Society) that this organization has not held an annual meeting. We are asking our scheduled speakers to write out their talks so that we may have these papers to publish in our next report.

Twenty-seven new members were added to our Society during the past year.—*Geo. W. Kinkead, Sec'y, Topeka.*

WASHINGTON—There is a good deal of interest in using zinc sulphate as a means of correcting Rosette. A paper entitled "Zinc Treatment for the Control of Rosette or Little Leaf of Fruit Trees" was prepared by R. L. Lindner and W. A. Luce for the last annual meeting of the Washington State Horticultural Association, and has created a lot of interest in

(Continued on page 37)



THIS YEAR, more than ever before, forward thinking fruit growers have made an early and definite start in their campaign against insects and fungous diseases. Their planning is along well-studied lines and includes only those spray materials and methods of *known* control efficiency. And, too, the plans of these alert growers, who are mindful of possible supply limitations caused by transportation delays and other wartime setbacks, call for getting the spray materials on hand *as early as possible.* Today the growers' chances of winning the harvest lie in planning the pest fight well, getting the right ammunition *now* and doing the job thoroughly.

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THE SOUR CHERRY

(Continued from page 9)

duction of the proprietary copper compound, such as Tennessee 26, Cupro K, Bordow, Spray-cop, Basicop, Coposil, Oxobordeaux, and others have been a real contribution to the control of leaf-spot. These materials are more effective than lime-sulfur, or wettable sulfur and cause less injury to fruit and foliage than bordeaux.

The number of leaves remaining on the spurs or twigs in the fall can be taken as a measure of the effectiveness of any spray material. The trees sprayed with the proprietary copper compounds retained more of their foliage until late in the fall than did trees sprayed with lime-sulfur or bordeaux. The defoliation on the trees sprayed with lime-sulfur was due to leaf-spot infection, while the loss of leaves on the trees sprayed with bordeaux was caused by copper injury. The improvement in spraying equipment has made it possible to apply sprays more thoroughly and, consequently, to obtain control with weaker dilution than those used several years ago. The old recommendation of 6-8-100 bordeaux, caused serious dwarfing of the fruit and has been replaced with the 2-4-100 bordeaux when bordeaux is used as a spray on sour cherries.

The data on the proprietary copper compounds are an average of the various materials applied in the experimental spraying the past two years.

Fermate, a new fungicide, is comparable with the proprietary copper material but does not seem to have any particular advantage.

There was little difference in size of fruit produced on trees sprayed with the various materials in 1943 and 1944.

Insect injury causes little defoliation on sour cherry. In some years the black cherry aphid causes some injury to foliage. Aphid-injured leaves when sprayed with a copper fungicide soon turn a mottled green and yellow and fall off. Controlling the black aphid in the dormant period with a D N Spray, or with nicotine early in the growing season will prevent the occurrence of this type of injury.

Cherry yellows, a virus disease, is next in importance to leaf-spot as a cause of premature defoliation of sour cherry. Probably it should be considered the most serious disease since it cannot be controlled by spraying. The cherry yellows disease has been present in orchards in most of the sour cherry growing sections of the United States for several years, but was not recognized as caused by a virus until 1939. A disease with similar symptoms was reported by Stewart in New York state in 1919, observed by growers in Michigan in 1920, and was shown to be a virus disease by Keitt in Wisconsin in 1939.

Defoliation caused by cherry yellows varies in the time of year it occurs in different seasons and in different localities. It may occur as early as 2 to 3 weeks after bloom and as late as harvest time. There may be one or more waves of defoliation in a season. Usually the first wave is the most pronounced. The amount of defoliation varies from tree to tree. Trees severely defoliated may loose 50 percent or more of their leaves while lightly infected trees may lose less than five percent during the same period. The amount of defoliation on individual trees also varies from year to year. In 1941 defoliation was severe and there was little difficulty in diagnosing the disease. In 1944 defoliation was very light, and the length of time that yellow leaf symptoms were noticeable was only 4 to 5 days. Trees, however, which show heavy defoliation one year continue to show a correspondingly heavy defoliation in following years. Defoliation on some trees becomes progressively greater from year to year, while other trees may show only a light defoliation for a number of years. The first leaves formed are the first to become affected and fall. In some years when a late wave of defoliation occurs, the leaves in the middle of a twig become affected and fall while leaves above and below the defoliated buds remain.

The color of the fallen leaves varies from all green to all yellow. Most of the affected leaves, however, show a varying amount of yellow and green color. Some leaves have a mottled green and yellow appearance, others are yellow with a definite green mid-rib and veins. One of the most characteristic symptoms of this disease is yellow leaves with the green mid-rib and veins.

Cherry yellows also influences the size of leaves and type of growth. Trees which have suffered heavy defoliation for several years produce leaves larger than normal, have fewer spurs, and the twigs show long bare spaces, giving the trees a willowy appearance. The crop on such

(Continued on page 32)

NUT GROWER NEWS

PLANTING SEEDLING NUT TREES

THE planting of seedling nut trees instead of grafted trees of named varieties has never been encouraged to any great extent. There are, however, some arguments for the seedling trees and it is the purpose of this note to point out their advantages and disadvantages for planters who may be interested in them. With present labor shortages and greatly increased demand, trees of the named varieties are in short supply and some nurseries have gone out of business, or are temporarily unable to supply the vegetatively propagated trees.

The principal advantage of the seedling tree is that it is much less expensive than the grafted tree. The propagation of nut trees by grafting and budding is rather difficult and requires considerable skill.

For large scale planting the seedling trees are useful because of their low cost, and they permit planting on a much larger scale than would be possible if grafted trees had to be purchased. Seedling trees may be raised easily by anyone, whereas much skill and practice are required to produce grafted and budded trees.

The planter of seedling trees may also contribute to the improvement of the species by selecting his seeds from named varieties of superior merit. If the seeds come from a variety collection removed some distance from wild trees it is likely that both parents of the resulting seedlings will be named varieties. The planter should plan on eventually comparing the nuts from his trees with those from the named varieties.

The principal disadvantage of seedling trees is their variability and the lower average of merit than in an orchard composed entirely of grafted trees. With the increasing use of commercial cracking machinery this is less serious than if the nuts are all to be cracked by hand.

Instructions for growing nut trees from seeds may be found in Bulletin 573, "Nut Growing in New York," which is available from the Mailing Room, College of Agriculture, Ithaca, N.Y.—GEORGE L. SLATE, Sec'y, Northern Nut Growers Assn., Geneva, N.Y.

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- IN THE MOTH STAGE

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Use S-W Nico-Mulsion for control of heavy infestations of late brood codling moth, where newly-hatched larvae and eggs, must be immediately controlled.

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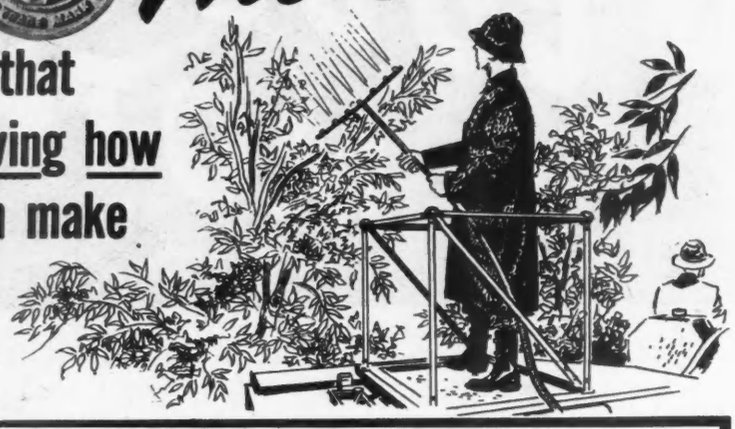

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THE FULTON ORCHARD

(Continued from page 11)

platform. The main line of the B. & O. Railroad passes just behind the storage, thus making rail shipments easily accomplished. National Route 40 passes the front of the building, making easy access to the packing house by truck. It is almost an ideal location from the standpoint of marketing or shipping. The second or ground floor is made up of a cold storage and grading and packing room. On the floor are a new large grader and a peach sizer. All apples are brushed before going over the grader and peaches are defuzzed by the same machine. It requires about 50 workers to operate the grader at full capacity of 200 packed bushels of apples per hour.

The third floor is composed of a storeroom for baskets and supplies over the packing room and another cold storage room directly over the one below. The refrigerated storages are automatically held at a temperature of 29 to 32 degrees; humidity is kept at 85 to 90 percent. Two 6 by 6 compressors employing 100 h.p. (electric motors) keep the storages cooled. Ammonia is the refrigerant used. The compressors are ordinarily in operation from 7 p.m. to 6 a.m., being turned off during the day. During the harvesting season they are sometimes run the full day in order to take care of the heat brought in by the newly stored apples. The packing room is also automatically air-conditioned, thus giving workers ideal working conditions, a fact which Mr. Fulton believes is important.

To feed this large, modern, cold storage requires considerable planning in order to make it an efficient enterprise. The building was completed just in time for last year's apple crop. In fact the day after the concrete was poured for the floor, apples were set in and the grader set in operation. Mr. Fulton said it was nip and tuck for a while until things were a bit settled. He utilized all available help last season to harvest the crop and to get it in the storage as soon as possible. Fortunately his crop was smaller than usual and the storage held the entire crop of fruit, about 103,000 bushels. Later, as marketed, the apples are graded and packed, the smaller ones and culls going to the nearby processing plants. On the average, including this year, Mr. Fulton packs from 78 to 84 percent of his crop as U.S. No. 1 apples. Many of his 2 to 2¼ inch apples were sold to lend-lease this year.

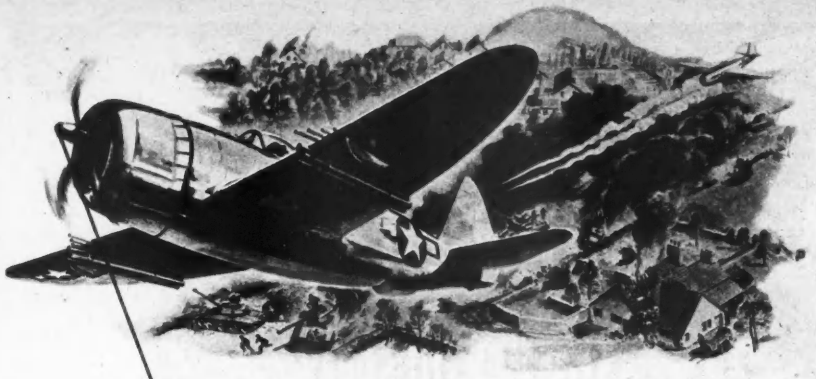
The entire crop of Fulton No. 1 York Imperial's are being marketed in 5 pound mesh bags this year. This grower was one of the first to use this type of container in the Appalachian region and the first to pack York Imperials this way. This type of pack goes largely to the chain stores. He considers them a very satisfactory type of package, one the consumer likes. Most of his crop is shipped out in bushel baskets.

The Fulton Orchards are pretty well mechanized and motorized, having in operation 20 to 25 trucks varying in size from ½ ton pick-ups to large 1½ ton trucks. These are used largely for local hauling and orchard operations. He plans to replace some of the1½ ton trucks with larger 8-ton trucks. Five or 6 of these will be used for more long distance hauling.

Marketing is handled largely by a family cooperative marketing agency, the Appalachian Fruit Growers of Cumberland, Maryland. A packing house manager is on duty all day to receive orders and to make out shipments. All fruit is shipped out under federal inspection, a federal inspector being on duty at the packing plant all season.

The big operation in any orchard is spraying. At present the 800-acre Fulton orchard is equipped with four 50-gallon per minute pumps and one stationary outfit. The latter covers one 200 acre orchard. The pressure pumps operate at 700 pounds pressure from a power take-off on diesel caterpillar tractors. The tanks hold 500 gallons. Each sprayer is equipped with 4 hoses, each 150 feet long with a gun. Mr. Fulton uses these large power sprayers as semi-stationary outfits. The sprayer is not in constant motion while spraying. It stops periodically and 16 trees are sprayed at a stop. That is, 4 trees in each of the 2 rows on both sides of the sprayer are completely covered at a stop. When the first 16 trees are thoroughly covered, the sprayer is moved on to the next 16, and so on throughout the orchard. All the spraying is done from the ground, thus getting good coverage both inside and out of the tree. A large water tank equipped with a 150 gallon per minute centrifugal pump hauls water to the sprayers, thus no time is lost in obtaining water. Mr. Fulton is always on the job checking up on the spraymen to make sure that they get at least 20 gallons of spray per tree. This is, on the average, 320 gallons delivered at a set of 16 trees. With the four sprayers in operation, 2000 gallons of spray are delivered per gun per day. There are prob-

(Continued on page 26)



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We can't sleep in peace, we can't eat, we can't work, so how in thunder can we raise a family."

Seriously, Orthol-K phytonomic Summer Oil Sprays—ovicidal, poison retaining and contact killing—are controlling the codling moth effectively.

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SCIENTIFIC ORTHO PEST CONTROL

complete spray programs

CALIFORNIA SPRAY-CHEMICAL CORPORATION
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THE FULTON ORCHARD

(Continued from page 25)

ably few orchards equipped in this manner, but Mr. Fulton likes the results. He is, however, planning some changes.

In place of two of the portable sprayers he is installing another stationary spray outfit. Eventually he hopes to have the entire 800 acres covered by stationary pumps. This old system of spraying is well adapted to this rough and mountainous fruit growing region and it has been used to some extent in this area for many years.

Mr. Fulton's spray schedule is rather simple, but he seems to get good results. Dormant spraying is accomplished with a 3 percent oil. He buys tank cars of the oil and does his own emulsification. When aphis are abundant, a dormant spray of Elgetol is applied. It costs about 50 cents per 100 gallons of spray, an economical figure. For the pink and prepink applications he uses liquid lime-sulfur, 2 gallons per 100 gallons water. In the petal-fall spray, wettable sulfur is used at manufacturers' recommendations plus 3 pounds lead arsenate and 3 pounds lime per 100 gallons.

His cover sprays are simplest of all. Normally he applies only two. The first coming about a week to 10 days after petal-fall and the second in exactly 7 days after the first. This is, of course, primarily a codling moth spray, a very important pest in this region. Four pounds arsenate of lead and 4 pounds of lime with 1 pint nicotine sulfate to 100 gallons water are used. A third cover spray of the same concentration will follow in just 7 days after the second if there are sufficient moths caught in the bait pans to warrant such a spray. So far he has seldom used more than the two.

Harvest sprays and dusts are used in the orchards to prolong the picking season and to harvest a higher percentage of good fruit. One orchard was sprayed with a hormone spray last fall and others were dusted with the same type of material. Three tons of the dust were used last fall to halt the drop of apples.

Some of the new deblossoming or blossom thinning sprays were used last spring. Transparent and York Imperial varieties were thinned in this manner with good results. Mr. Fulton, along with many other growers of this region, is convinced that, if the spray removes from ½ to ¾ of the blossoms it should, it is worth using. This greatly reduces the job of hand-thinning later in the spring.

The blossom thinning sprays have not as yet been used on the peaches, but neighboring growers report success with them.

A few facts about the peach plantings seems in order before we close this visit. Elberta is his chief variety. Hale and the new Red Cheek variety from the Maryland Experiment Station are other varieties grown to a limited extent. Brown rot is not a problem here. A portable sprayer and a duster are used, primarily for control of curculio and tarnish plant bug. In viewing the future, Mr. Fulton plans to make all peach plantings 25 feet on the square; that is, 25 feet between trees. Rotation of plantings is another good idea. Keep the orchards young is his policy. As plantings become inefficient in production pull them out, but at the same time have younger plantings come into bearing.

Since most of the orchards in this area are on shale soils, the chief soil problem is to increase the organic matter content. Stanley Fulton accomplishes this in his orchards by growing cover crops of orchard grass and bluegrass. Every other year, after the grass makes its maximum growth in early summer, it is thoroughly disced into the soil. This is done before June when the moisture problem becomes critical. The cover crop is fertilized every year with 300 pounds per acre of 20 percent superphosphate, broadcast. Nitrate fertilizer is applied to the trees at the rate of 5 to 8 pounds per tree. The amount depends upon the amount of growth the individual tree is making. From 4 to 8 inches of terminal growth per year is satisfactory, Mr. Fulton feels. If growth becomes too excessive, poor color of the fruit results. A tree that is making this amount of terminal growth receives only a little nitrate fertilizer, those making less will, of course, receive more. Mulch is not used because mice would then become a problem.

In due time there will be further improvements and additions to the Fulton enterprises. Among plans for post-war development are a frozen locker plant in connection with the cold storage and an attractive roadside market. Mr. Fulton plans a centralized repair shop and garage at the packing house, which is within a five mile radius of all five of his orchards. Here will be housed all the equipment and provisions made to overhaul them.

It is growers like these in the realms of fruit production who make it such an important and essential part of American agriculture.

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Five minutes of heavy hail can destroy or seriously damage a fruit crop. Yet, many growers are content in the belief that their farm is immune from hail.

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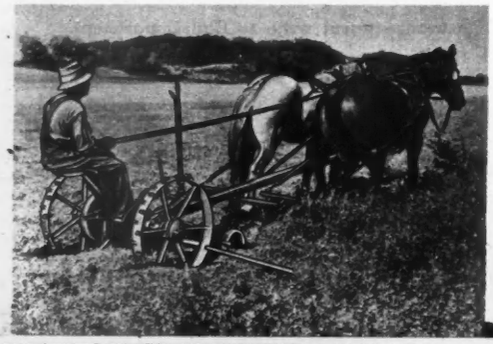

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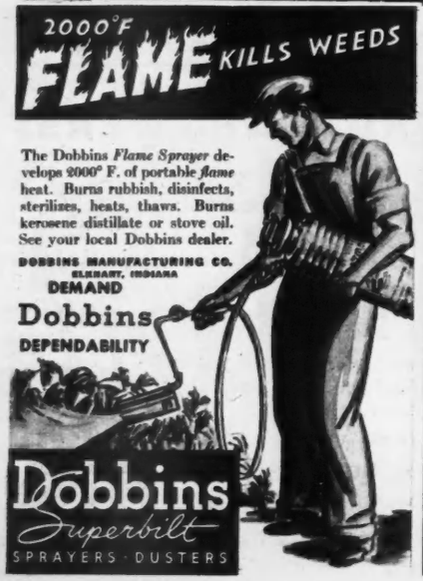

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DELAYED ACTION SPRAYS

(Continued from page 10)

Delay in bud growth varied with the concentration of spray, its time of application, and the variety of fruit. In addition to naphthaleneacetic acid used in the earlier tests, other substances such as 2, 4, 5-trichlorophenoxyacetic and 2,4-dichlorophenoxyacetic acids have also proved effective but at lower concentrations than naphthaleneacetic acid or its potassium salt. When the latter substance (potassium naphthaleneacetate) was used, a concentration of 0.02 percent was effective on Montmorency cherry when applied in late July, but a month later 0.04 percent and two months later 0.08 percent solutions were required to give the same amount of retardation the following spring.

The same treatments were effective on apple but were too strong for peach and plum when applied in July and August.

A word of caution regarding the use of these sprays seems necessary in view of the fact that if not used properly, they are capable of causing severe damage. Some of these substances have recently received considerable publicity as weed killers. When applied to fruit trees concentrations which are too high or which are applied too early may kill many buds and even twigs and branches, or the buds may be prevented from developing to normal size. Even without killing twigs it is possible to prevent the growth of many leaf buds for periods of several months and thus reduce the foliage to a point where trees will not make a normal growth. In the region of New York City the month of August appears to be the earliest time the sprays can be applied safely to cherry and after the middle of September for peach. But in conjunction with this limitation it is well to wait until the flower buds are nearly mature in size, which of course will vary with the variety used. Also, sprays are more effective at temperatures above 70° F. than below 70° F. This means that tests should first be tried on a small scale in order to determine the requirements for any particular case or set of conditions.

Possible practical uses of bud retarding substances are of course not confined to the examples described for fruit trees. There are a few cases in which non-dormant buds (that is, buds which will grow if provided with the proper temperature and moisture conditions) can be prevented from growing or delayed for at least a few weeks as a result of treatment with naphthaleneacetic acid and other in-

hibitors. Roses have been treated in storage to delay growth prior to and during shipment. Potato tubers designed for table use have been delayed up to one year by vapor treatment with esters of naththaleneacetic acid. Flowering of pineapples has been delayed, but in this case naphthaleneacetic acid was applied one month prior to the time of normal differentiation of the inflorescence, which means that the early developmental stages of flower bud formation were delayed. This type of treatment should not be confused with the delayed action spray described for fruit trees in which the plants are treated not only after the flower buds have formed, but when they are nearly mature in size and before they go into a winter rest period.

• APS •

(Continued from page 16)

proved performance of new varieties in all kinds of fruits demonstrates that new varieties cannot be ignored. The fact that a large part of the new introductions do not make the grade is little reason for condemning all new varieties, because a few new varieties do make good and may, as in the past, become important in a region or even throughout the nation.

The American Pomological Society has a committee on New Fruit and Nut Variety Lists, headed by Mr. H. P. Gould, Washington, D. C. Mr. Gould is widely known in horticultural circles by reason of his long association with pomological work with the United States Department of Agriculture. This committee searches the literature, including nursery catalogs, and lists in its annual reports the names of new fruit and nut varieties and a statement covering their origin or introduction. These annual lists are printed in the annual reports of the American Pomological Society. There is no attempt on the part of this committee to evaluate the varieties in the list. It is proposed that an alphabetical index list of all new variety names which have appeared in the reports since 1920 be published.

The Code of Nomenclature Committee, headed by Dr. M. J. Dorsey, University of Illinois, Urbana, Illinois, has kept the Code up-to-date by making the revisions necessary to do this. The Code is a set of rules for the guidance of those who wish to name new varieties.

H. L. Lantz
Secretary

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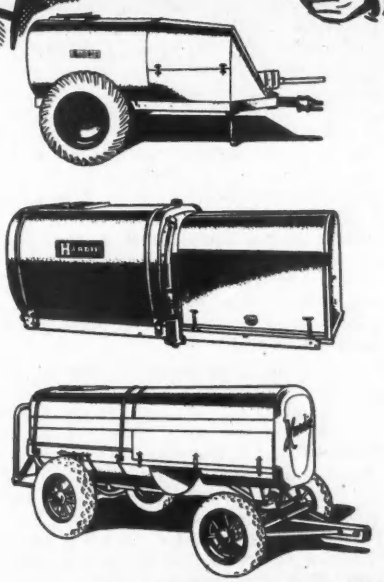

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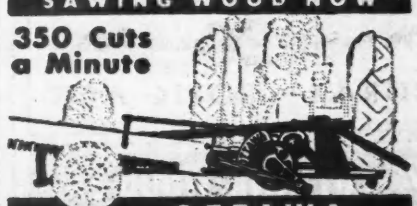

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APPLE CONSUMPTION

(Continued from page 7).

handle and rarely thinks of his consumer.

There is nothing original about these observations, but I do really think the key to our success is getting the public to use our fruit in a volume corresponding to that of today, lies in the varieties the consumer has to choose from. Five years ago I thought I had all the Cortlands I wanted and started to set MacIntosh again. The last orchard I set was half of MacIntosh and half Richared. If they had all been Richared or Cortlands my choice would have been perfect. The Spy is the only old variety that is called for in quantity. The reader may think I am partial to Cortland but the following are cold actual figures on consumer demand at my storage: Cortland, 83%; Delicious, 10%; Spy, 5%; Greening and Baldwin each 1%, and but one customer for MacIntosh.

In my estimation, the Northeast has a great opportunity in regaining the habit of eating apples in producing the Cortland and by starting an honest movement to eradicate the "weeds" of our orchards. No farmer on earth would make his horses eat Hubbardsons, King Davids, Russets, Ben Davis, Wealthy and about another hundred varieties still being grown in New York State on a commercial scale, and yet we wonder why people refuse to eat apples. The unsuspecting customer only has to get stuck about twice a year with a nice big red apple like Wolf River to turn to something else for dessert purposes. If our Farm Bureau could start a campaign to get farmers signed up to pull one in ten of the outmoded varieties each year, and set some usable variety in its place, the apple would be back in its good graces in just ten years.

One thing I neglected to say about the Cortland that makes many growers dislike to grow it. Be sure to let the fruit mature fully and then place in your own storage at 33 degrees and it will never brown. Too much nitrogenous fertilizer throws the color off balance easily and the fruit must be stored where it will not take on any obnoxious odor. It takes plenty of spraying to produce good Cortlands but not more than MacIntosh.

My last two recommendations will make most growers scream. An apple grader is the most senseless machine ever produced. In the first place, it was proven beyond a doubt a few years ago when we all had too many large Macks, and the market kept dropping on this one item, that not even a majority of the consumers want a large apple. This winter when I have had time to retail, I have watched the consumer pick out his apples. A mother with children wants them comparatively small while a hostess planning a fancy dessert wants a few large apples. All storekeepers agree that an ungraded basket of apples works out to perfection. Everything above 2½", of course. Then too, it is hard to take out all apples with blemishes when they go over the grader, especially anything off color. But the worst item against the mechanical grader is the factor of bruising. I saw fancy Cortlands selling in a large city chain this winter for less than I am getting for my seconds. What is worse, the storekeeper said they were selling so slow they would spoil before he could possibly get rid of them. They were so bruised I would not have taken them as a gift. If the average user of mechanical graders would follow his fruit to the ultimate consumer and see how he was slowing up the sales of this almost indispensable fruit, there would never be another one sold.

Secondly, our fruit committees should work toward a goal to do away with this unholy "Combination Pack." Most city fruit dealers are crooked enough to mix No. 1's with No. 2's without our doing it for him. Where this combination pack is dumped out in a bin the consumer paws the pile over till he finds a few good apples and soon the already poor ones are bruised beyond recognition. This junk then sets there until some sucker takes it away and in the meantime dozens of otherwise good sales are lost. For years I have been grading my fruit three ways and finding ready sales for each. I have converted six of the eight fruit stores in our little town to using nothing but fancy stuff. If there is anything unsatisfactory in the bottom of the basket when I bring in a new supply, it is removed. Stores that were selling only a box or two of "imported" apples before I took the trouble to get them started right, are now selling three and four times that amount. You are rewarded for the trouble by hearing the "Ahs" instead of groans when you walk into a store with this fancy stuff.

Of course, I can hear you say you can get the ceiling on any kind of junk right now, and that is true. The condition last spring was so reversed from that of 1933 and '34 that fruit dealers were selling unmarked fruit for top prices and telling the storekeepers that it was against the OPA rules to look into a basket. These prices are blissful but I had such a jolt during the depression when fancy MacIntosh were selling for less than a dollar, that I wish we could do something about our grades. There are too many growers producing apples as a side line.

Silver Creek, N. Y. R. M. Clothier

Thanks for the interesting treatise on many phases of fruit growing. To our other readers we say, "Comments, Please!"—Ed.

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We have sufficient seed in ground to produce about a half million June Buds, and would welcome a few substantial commercial or wholesale contracts for Fall delivery. Orders received prior to May 15th will be budded according to specification.

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THE ORCHARD SOIL

(Continued from page 12)

kept as near ideal the whole year round as possible. In the wintertime a root probably absorbs slowly small quantities of mineral nutrient elements as well as soluble nitrogen compounds. It seems reasonable that the protecting cover of a good mulch will favor a greater root activity in the cold winter months than when there is no mulch, or when the ground is unprotected.

The requirements of a tree root and that of angleworms differ with respect to organic matter. The angleworm requires organic matter as part of its food for energy. The organic matter in the soil merely helps the numerous soil conditions to be favorable for the numerous functions of the root, but the plant gets its energy directly from the sun in building its own carbohydrates (sugars) in the leaves which are carried down through the plant to furnish the strength to the root so that it can push itself through the soil into new soil feeding grounds.

Roots Must Take Up Nutrients

The nutrient element that trees starve for most frequently is nitrogen. If a soil is rich in organic matter, chances are that the supply of available nitrogen to the root is fairly constant. If the soil is low in organic matter and nitrogen is supplied only as chemical compounds in fertilizers, the root is compelled to feed intermittently or only as the soluble nitrogen compounds are accessible. This may mean that shortly after the application of nitrogen fertilizers to soils low in organic matter the nutrient intake by the roots may be temporarily unbalanced by being too rich in nitrogen and too poor in phosphorus, potash, calcium, magnesium, sulfur or perhaps trace elements as boron, iron, manganese, copper or zinc.

The reason fruit trees on most soils do not respond to mineral fertilization is because nitrogen is usually the first limiting nutrient element. Whenever the nitrogen is applied, there may be periods following the applications that the nitrogen supply is likely to be abundantly or even exclusively available to the roots of the tree or plant; in this period the root may be starving for the mineral elements. This condition does not manifest itself clearly in a plant as large as a tree because the vast quantities of tissue structures in a big plant have considerable storage capacity, and this storage capacity tends to level off the shock of unbalanced feeding.

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Some orchardists have purchased the Allis-Chalmers Model B tractor because of its convenient hydraulic lift — providing precision control of mounted equipment.

Others selected this tractor directly for its fuel economy — the ability to accomplish so many power tasks in terms of *quarts* instead of gallons.

Some fruit growers decided on the Model B because it is exactly adequate for a host of orchard jobs — not too large nor too small. Others are happy they bought this tractor because its upkeep is practically negligible.

You may want to own the Allis-Chalmers Model B tractor because it delivers an "orchard-sized" package of modern mechanical power on a mighty reasonable investment. In any case, you'll soon discover its one all-inclusive feature — satisfaction.

Although the supply of tractors for 1945 is limited, it's well worth talking over now with your Allis-Chalmers dealer.

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THE SOUR CHERRY

(Continued from page 22)

trees, because of the limited number of spurs,. is greatly reduced and the individual fruits are larger. In 1941 .the average yield on 66 diseased trees was 88 pounds, while on 64 healthy trees the yield was 187 pounds. This represents a decrease in yield of 53 percent on the diseased trees.

Because the cherry yellows disease has been recognized as a virus for only a few years, little is known about how it spreads from tree to tree. It can be transmitted by budding, and no doubt nursery companies have unintentionally propagated trees from diseased scion wood.

The control measures recommended for cherry yellows will vary with the age of the orchard and the seriousness of the disease in a locality. In bearing orchards, where the dis ease is well established, the most practical control measure is to keep the orchard until it is no longer profitable and then pull all the trees, and practise a soil building program for a year or two before replanting. This recommendation is made because it is impossible from our present knowledge to recognize all the diseased trees in an orchard. Observations in bearing orchards where diseased trees have been replaced show that some of the replanted trees become infected in a few years.

When planting a new orchard the grower should attempt to purchase as disease free trees as possible. Then become familiar with the symptoms of the disease and rouge the orchard every year regularly. Any diseased trees should be promptly removed and burned.

There is one bright spot in our observations on cherry yellows: that is, the apparent susceptibility or resistance of selections of the Montmorency variety to this disease. Director Gardner of the Michigan Agricultural Experiment Station became interested in the variations of individual trees of the Montmorency cherry about 15 years ago. Over 200 selections were collected, propagated and grown at the Graham Experiment Station at Grand Rapids, Michigan. These selections consist of many kinds and types of trees, varying from dwarfed and stunted to large and vigorous trees; from productive to barren trees; from short-stemmed to extra-long-stemmed fruits; from a willowy type of growth to a sturdy, heavy growth; from a spreading to a compact form of growth; and from trees showing severe cherry yellows symptoms to healthy vigorous trees. This collection of Montmorency cherry trees teaches an excellent lesson on the importance of care in selecting scion wood for propagating purposes.

In one block of 10-year-old trees there are 70 of these selections, and all of the trees in some selections are diseased. All of the trees in other selections still remain healthy, while still other selections contain both healthy and diseased trees.

It is hoped that some of these healthy selections may prove to be resistant or only slightly susceptible to the cherry yellows disease. Some of them are good productive types, and new orchards propagated from them should be a real asset to the cherry industry.

The various causes of premature defoliation require different control measures. Insect and fungus diseases can be most effectively controlled by spraying; cherry yellows by rougeing and planting disease free trees; drough injury by selecting a suitable soil, mulching and avoiding too close planting and spray injury by using the less caustic spray materials. It is important that growers become familiar with the symptoms of these different types of injury.

Effect of Several Fungicides on Leaf-spot Control, Size of Fruit and on Spray Injury on Sour Cherries, 1943-1944

Materials	Amount in 100 Gal. Spray	No. Leaves 100 Spurs 1943 Sept. 25	1943 Oct. 18	1944 July 7	1944 Oct. 18	Size of Fruit No. Fruits per lb. 1943	1944
Lime Sulfur	2½ Gal.	399	270	—	—	147	—
Bordeaux	2 to 4	305	196	492	207	148	154
Proprietary Copper Compound	½ to ¾ lb. Metallic Copper plus 3 to 4 lbs. lime	439	377	500	445	143	150
Fermate	1½ lbs.	438	377	508	428	141	158

The regular four-spray program as previously outlined was used in these experiments.

PLEASING CONSUMERS

(Continued from page 13)

in the Western box than in the bushel basket, the loss in the store was greater in the Western box because this container was not readily accepted by the consumer. Most of the peaches shipped to the stores in the Western box had to be sold in small amounts instead of by the box. This held true regardless of the income area. The general reaction of the consumer was that the box did not look like a full bushel container.

The bushel basket moved well as the consumer was well acquainted with this container. However, there was complaint in most cases because of the bruised fruit, and with some justification, as 65 to 70 percent of the fruit in this container showed some bruising and 11 to 15 percent was so severely bruised as to make it unsatisfactory for canning.

The cell-box, holding just a half-bushel, 96 peaches, moved exceptionally well at a price of two cents per bushel higher than the regular bushel price. The housewife found that the spoilage in the cell-box was much less than in the bushel basket and before the close of the first week of the experiment we had consumers asking for the peaches in the cell-box. After the supply of cell-boxes was depleted some even offered, through a mistaken idea of the purpose of this container, to return the boxes to have them refilled.

I believe the cell-type box has real possibilities as a container for the marketing of peaches. Riper peaches can be shipped in this container and with less bruising than in any container previously used in our shipping experiments. However, handling costs must be worked out and compared with the standard bushel basket.

Experiments with a consumer container of eight peaches weighing approximately two pounds were conducted in 1943 without any great encouragement from the consumer. They were continued for a part of the experiment in 1944 without conclusive results. It is planned to explore this phase of the problem fully this coming season.

Last year's cooperators have indicated their desire to continue the work until definite recommendations can be made. The accompanying table (Page 13) indicates that the use of pre-cooling, for instance, is of appreciable benefit under most conditions. Use of the cell-type box will be greatly expanded this year, according to present plans.

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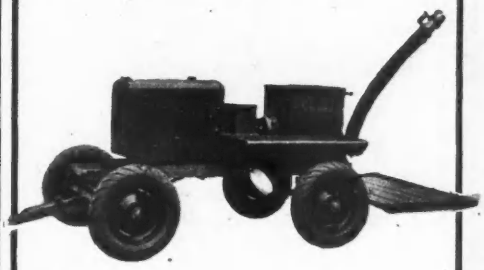

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From where I sit ... *by* Joe Marsh

Lud Denny Solves the Locust Problem

Lud Denny may not be much of a farmer, but most folks allow he's pretty smart at solving other people's problems. Like Alvin Blake's locusts.

For years Alvin has been trying to get rid of a grove of locusts. They aren't using up any good land, but they annoy Alvin. Every time he cuts them down, up they shoot again.

"What'll I do about them locusts?" Alvin asks Lud. "Well, if you can't get rid of 'em," says Lud, "I'd say you better get to like 'em."

From where I sit, that's sound philosophy — applies to people just as much as locust trees. You can't always change folks to your way of thinking — some may prefer beer to buttermilk, or a double harness to a single one — but you can get to like them (if you take the trouble).

And first thing you know, the little differences don't matter.

Joe Marsh

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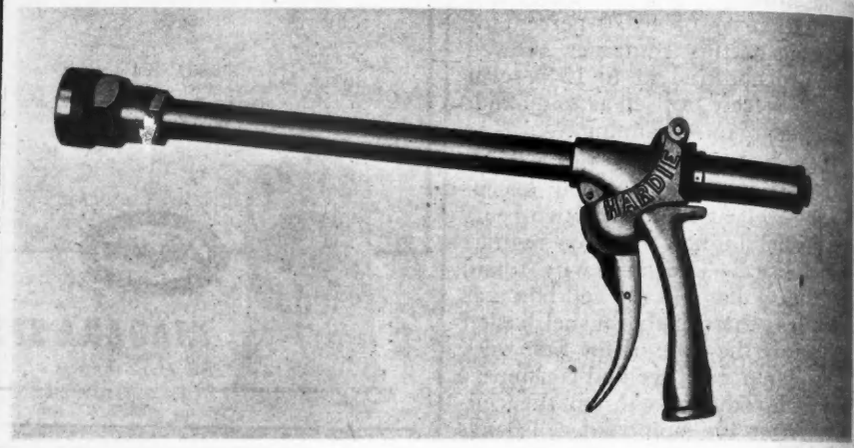

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The TILL-MASTER, developed and field tested in the Pacific northwest, plows, discs and harrows in one operation, meeting today's demand for time and labor saving through complete preparation of the seedbed in one trip around the field.

Soil is prepared to the desired depth by the 14-inch diameter spiral cutter made of high grade steel and formed as a continuous spiral over the entire length of the shaft. In operation, the cutting edge plows and discs with an overlapping and uniform thoroughness over the entire length of the cut. Hand levers on each side provide adjustment for the depth of the cut and for lifting the cutter while traveling to and from the field.

Complete manufacturing, distribution and sales rights for the TILL-MASTER have been acquired by the Climax Engineering Company.

PEACH INDUSTRY

(Continued from page 14)

trees in an open center or vase form, keeping three to five scaffold branches and limiting the height to the point where they can be handled from a ten to twelve-foot ladder. A large percentage of the fruiting wood may be borne on "hangers" from the permanent branches, which may be renewed to maintain vigor. Thinning of the fruiting wood to reduce excessive setting and to help maintain vigor constitutes the major part of the pruning of bearing trees.

An important orchard operation is thinning. Research by the California Experiment Station over a long period of years has shown that sizes can be rather accurately controlled by proper timing and by leaving the right number of fruits per tree. The problem of gumming of fruits, exhibited by the Phillips particularly, has been solved to a considerable degree by delaying thinning to the period just subsequent to the appearance of the gum. The fact that the peach rarely fails to set more fruits than it can mature in spite of occasional frosts makes thinning necessary nearly every year.

Most California soils are well supplied with potassium, and only rarely have responses to application of this material been noted. Where shallow soil or poor root distribution have caused low potassium intake, heavy single applications below the cultivated zone have been more satisfactory than light annual applications, and except on light soils, broadcasting has not permitted penetration to the root zone because of fixation. No case has yet been varified of phosphate deficiency for peaches. Covercrops may require this material for satisfactory growth on some soils, but the trees themselves have not responded. A high percentage of California peach orchards respond profitably to nitrogen fertilization. Recent figures obtained from application forms required from purchasers indicate that about half of the total peach acreage in the state receives nitrogen, but the proportion in the important districts is well above this figure. The usual rate is about 100 pounds of actual N per acre, but some orchards may use twice that with benefit.

Most peach plantings have been made on peach stock, usually on Lovell seedlings in recent years. However, since the introduction of nematode resistant stocks, such as Shalil and Bokhara, many orchards on the lighter soil types have been propagated on these stocks.

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20.6% NITROGEN
70% LIME

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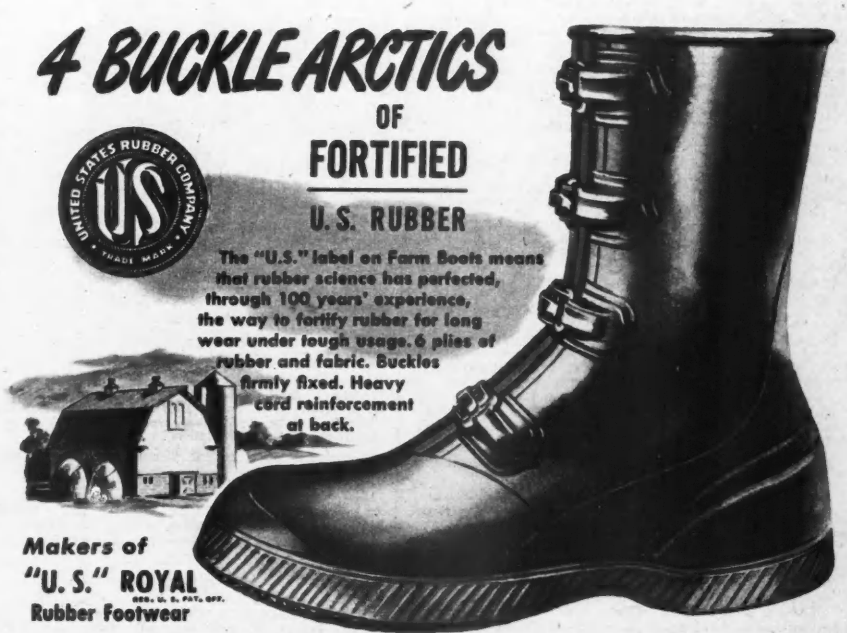

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SCHLICHTMAN'S U. S. APPROVED, PULLORUM Tested Chicks. Per 100 prepaid. Leghorns, Rocks, Reds, Orpington, Wyandottes, Minorcas, $9.40. Leftovers $7.45. Pedigree sired and sexed chicks. Free catalog explaining 2-week replacement guarantee. SCHLICHTMAN HATCHERY, Appleton City, Missouri.

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HARDIE FACTORY RECONDITIONED TRIPLEX 12-gal. pump. Duplex 8-gal. pump. 8-horse Cushman Motor. 100-gal. tank with trucks. 500-gal. steel pressure tank. HARRY CHINNOCK, Jonesville, Michigan.

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ORCHARD FARM HAND; EXPERIENCED; SINGLE preferred; essential, steady job; good wages; board and room. State age and qualifications. RUNDHURST ORCHARDS, Route 9, Box 439, Lemay 23, (St. Louis County) Missouri.

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JUNE BUD PEACH. AM NOW ACCEPTING ORDERS for Fall delivery. Should have half million peaches for commercial and wholesale trade. Write for prices. FARMERS WHOLESALE NURSERY, P.O. Box 34, Smithville, Tennessee.

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STRAWBERRY PLANTS—CERTIFIED, HARDY, SElected for yield, Dunlap, Blakemore, Beaver, Premier, Bellmar—175—$2.00; 500—$5.40; 1,000—$10.50. Giant Gem Everbearing—100—$2.50; 500—$11.50; Mammoth Rhubarb 12—$1.00. Everything Postpaid. Prompt shipment. RIDER NURSERY, Farmington, Iowa.

NEW MINN. 1166 EVERBEARING STRAWBERRY. Starts bearing 60 days after set, and continues to frost. 3 crops in 18 mo. Sweetest of all everbearers. Withstands hot dry weather. Berries keep a week after picked. Large, bright, red, sweet berries sell for $1.00 per quart. We are headquarters for this variety. Greatly reduced prices. Order direct from this ad. 25 plants for $2.00; 50 for $3.00; 100 for $5.00; 250 for $11.00. Prepaid. SOUTH MICHIGAN NURSERY, (Order Dept.) New Buffalo, Michigan.

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HYBRID WATERMELON SEED. MODERN MELON miracle. Sand unnecessary. Seed from 50 to 100 pound watermelons. Two luscious cantaloupes. Free booklet or $1.00 for 700 seeds. AIRLINE FARMS, Clay Center, Kansas.

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FIELDGROWN VEGETABLE PLANTS NOW READY. WRITE for free catalog. OMEGA PLANT FARMS, Omega, Georgia.

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EARLY BIRD TREE BANDS CHEMICALLY TREATED. Kills the Codling Moth. Send orders early. EDWIN H. HOUSE, Saugatuck, Michigan.

SUREKILL TREATED TREE BANDS AVAILABLE for 1945. Orders being booked now. Write for prices. M. A. KOELLER, Barry, Illinois.

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HAVING CAR TROUBLE? USED, GUARANTEED auto, truck parts save money. Transmission specialists. Describe needs; immediate reply. VICTORY, 2439 AZ Gunnison, Chicago 25, Illinois.

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MAGIC ELECTRIC WELDER, 110 VOLT AC-DC; welds, brazes, solders, cuts all metals, easy to use; full directions. Complete with power unit, flame and metallic arc attachments, carbons, fluxes, rods, mask. Guaranteed One Year. Only $19.95. Used by the Navy. Splendid for farm use. MAGIC WELDER MFG. CO., 241 LS Canal St., New York, New York.

TESTING FROZEN FRUIT

A QUICK and simple test, recently developed by J. D. Ponting, of Western Regional Research Laboratory staff, is of much interest to the fruit processing industry. The test tells whether fruit sliced for freezing has had enough pre-treatment to prevent it from turning brown, either before or after freezing.

The brown discoloration of apples, peaches, pears, and several other fruits results from enzyme action. Enzymes start the oxidation of other chemicals in the fruit and this action causes browning. Inactivation of these enzymes prevents rapid browning. Sulphuring and heating by scalding are two effective anti-enzyme treatments. However, when good sized slices (suitable for pie making) are treated, the heat or the chemical may be effective near the surface but not in the centers of the pieces.

One of several substances that occurs naturally in these fruits, and which turns brown when oxidized is known as catechol. Catechol, itself, is on the market as a pure chemical.

In the new test it is only necessary to prepare a weak solution of pure catechol. After the fruit has been sulphured or scalded, the tester selects a few of the larger pieces and cuts them in two. On the cut surfaces he applies drops of the catechol solution. If the enzymes are inactive all through the slices, nothing happens. But if the heat or the sulphur dioxide has not penetrated completely, the cut exposes the enzymes that are still active and brown color will develop within a few minutes in the catechol on the area that would otherwise brown slowly.

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HOME OF THE FAMOUS
VOGUE ROOM
1000 ROOMS WITH BATH
RADIO IN EVERY ROOM
FIVE FINE RESTAURANTS
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WAR SURPLUS PROPERTY

A SERIES of sales of farm and construction machinery will be held during the period from April 2 through April 7 in Region I of the U. S. Treasury Department's Procurement Division of Surplus Property serving Connecticut, Maine, Massachusetts, New Hampshire, Vermont and Rhode Island. Farmers and contractors who are in need of farm and construction equipment should urge their dealers to attend these sales of Surplus Property. For further details consult the Regional Office located in the Park Square Building, Boston, Massachusetts.

Surplus Property sales of farm and construction machinery have been held in other Regions throughout the Country during the past month, in Midvale, Utah; Tulsa and McAlester, Oklahoma; Dennison, Austin and San Antonio, Texas; and in New York City, New York. Farmers in these areas should check with their dealers for commodities that have long been scarce.

STATE NEWS

(Continued from page 20)

this subject. This paper appears in the Proceedings of the last annual meeting of the Association. A copy may be secured by writing to the secretary's office, Pullman, Washington, enclosing the usual membership fee of $2.00.

Plans are being made to apply zinc to several hundred acres of apples by airplane. This is the first instance which has come to our attention for applying this material in this way. We are looking forward to this fast method of application with considerable hope.

There has been a great deal of discussion about what can be accomplished by pruning fruit trees. In general everyone is very much of the opinion that pruning must go hand in hand with fertilization. This theory is showing its influence in lightening up the amount of pruning that is being done. Special attention is now being given to the matter of eliminating surplus large branches. In many young trees there are too many large branches. The surplus of these large branches choked out the structural area of the tree. Growers are eliminating some of these branches. The idea of allowing fruiting wood to develop in the inside area, taking out some of these large branches, encourages the trees to spread out and to remain low. There seems to be a general opinion that three or four large structural branches are as many as should be allowed to remain in the trees permanently. Trees having six or eight must be pruned gradually. It is well to devote two or three years to the eliminating of the surplus scaffold branches. When these large branches are eliminated the remaining ones are allowed to continue to grow and are not headed. This is particularly true of such fruits as apples, cherries, prunes, filberts, and walnuts. Pears, peaches and apricots are possible exceptions.—*John C. Snyder, Sec'y, Pullman.*

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Stauffer CHEMICALS SINCE 1885

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CARBON BISULPHIDE THROUGH THE DEMON RODENT GUN

A single shot in each hole and the job is complete.

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Use the complete dust and spray for peaches! Protect your peach crop!

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FRUIT CROPS

By T. J. Talbert and A. E. Murneek. The newest practices and established fundamentals of orchard and small fruit culture are covered in the 345 pages comprising this volume. Fruit growing as an occupation, new fruit introductions, propagation, sites and soils, irrigation and drainage, soil management, insects and diseases, spraying and dusting, harvesting and grading, and marketing are discussed. Chapters are included on individual fruits and nuts. 112 illustrations add to the interest and value of the book. Sent postpaid on receipt of $3.75.

AMERICAN FRUIT GROWER

1370 Ontario St., Cleveland, Ohio

Destructive and Useful Insects

By C. L. Metcalf and W. P. Flint

Written in an interesting and easily understandable style, this book contains complete discussions on the important economic insects, including insect pests of deciduous and citrus fruits. Importance and type of injury, trees attacked, distribution, life history, appearance, habits and control measures are discussed for each insect. 918 pages. Profusely illustrated. $7.50.

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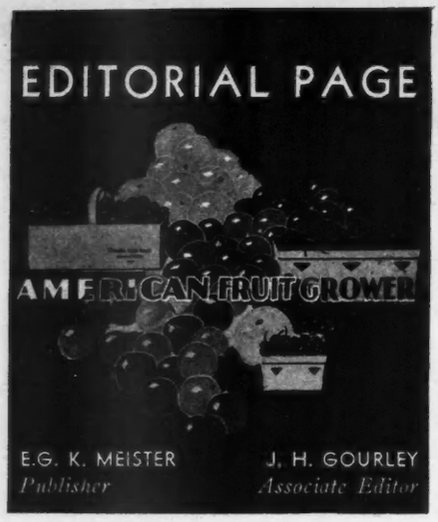

Rodent Injury to Young Trees

IN SOME SECTIONS of the country there were unusually long periods of snow and ice during the past winter. Wild life suffered as a result of this protracted ground coverage and rodents sought a livelihood by extensive girdling of trees. Species of trees which are rarely touched by rabbits were peeled as far as the rodents could reach. This presents a serious problem to the orchardist.

Since fruit stocks are quite scarce, it makes replacement almost impossible this Spring and raises the question of repair work such as grafting. Some salvage operations can be carried out on these young trees.

With one- or two-year old apple trees the little trunk can be sawed off at the lower limit of bark peeling and a cion inserted in a cleft. The cleft in the stock should be tied securely and all the exposed part covered or painted with brush wax, including the stock and the cion. The cleft can often be best made with a fine tooth saw rather than a chisel or knife. The cions should be wedged with a sharp knife, making a long tapering wedge about 1½ inches long. Many trees can be saved in this way.

It is also likely that a bud will start out above the original bud or graft union and this new shoot can be used to form a new tree. Part of the old tree stem should be left to tie the new shoot loosely to it in order to prevent breakage from the wind. This procedure is particularly adopted to young peach trees since they are even more likely to send out a shoot below the injury and they do not graft readily.

For older apple and pear trees, bridge grafting may be used to save the trees. This can usually be accomplished, but in many cases the resulting trees are something of cripples. Experiences vary depending on variety, age of tree, and success of the bridge graft. It is important to cover all the exposed wood with a good tree paint, as well as covering the cions with wax. Undoubtedly there will be a large amount of bridge grafting done this Spring on not only fruit but ornamental trees, or tree losses will be extremely heavy.

Another precaution should be made regarding bridge grafting. After the cions unite and growth starts, the buds on the cions will start to grow and unless they are rubbed or cut off, the upper union will be robbed and a weak union made which will likely break out or fail to continue growth.

Nearly all state experiment stations have illustrated bulletins on grafting procedures and the mixture of waxes. These bulletins can be obtained usually by writing to the station for them.

Conservation of Supplies

ANOTHER TIGHT SQUEEZE on farm machinery, equipment and supplies is indicated this year. The vast production of foods called for will require the efficient use of all available machinery in planting, cultivating and harvesting, and the careful utilization of all other supplies.

The War Food Administration calls attention to the need for (1) repair and care of farm machinery, (2) conservation of all textiles and sale of used textile bags to local dealers, (3) conservation of all wooden containers and early ordering of used containers for fruits and vegetables, (4) truck and tire conservation, (5) movement of fertilizer to farms without delay, (6) watchfulness against insect infestations so as to make insecticide supplies fully effective.

Orchard Industry Trends

WE ARE TOLD that the percentage of population on farms and in urban areas has been reversed in a hundred years. Where 80 percent was on farms, now 20 percent is rural. Whether it has yet reached a static condition, no one knows. Certainly no one is interested in a fruit grower, as such. He is only interested in what economic contributions the orchardist can make to society. If there are too many growers and more fruit is produced than can be sold at profit, then acreage must be reduced, more orchardists find their way into other employment, or new markets and uses for fruit must be found.

We need to have constantly before us the world picture of fruit production and consumption in order to plan with intelligence. Fruit juices, fruit juice concentrates, even "apple cyder" such as is used in large quantities in England, as well as apple wine, represent great potential new products and markets. Frozen apples largely replaced canned ones, just as canned ones replaced fresh apples.

In addition to national and state agencies, such organizations as the National Apple Institute, the Peach Council, the California Fruit Exchange, and the National Fruit Council, all point toward greater efficiency in marketing and marketing information, as well as many other matters vital to a planned fruit industry.

Labor Situation

IN 1945, the fruit grower finds he must meet an even greater challenge than he did in the preceding year. In 1944 he achieved an all-time high in fruit production with the least amount of labor on record. This year the grower is asked to do it again with perhaps even less manpower available than in 1944.

If the 1944 level of agricultural production is to be met or increased, it is felt that there should not be any further wholesale loss of manpower. Since 1940, the farm population has decreased by nearly 5 million, or 16 percent.

Even if the war in Europe should find an early termination, the farm labor situation would not be eased materially this year. Because of demobilization problems, and the need in the Pacific for experienced troops, not many men could be returned from the armed forces to the farms in time to help with the 1945 crop. Throughout the year, industry's manpower requirements are expected to remain high.

All facts concerning the 1945 farm labor outlook emphasize the need for recruiting of labor locally by State and county extension service personnel on an even more intensive scale than last year. Where necessary, foreign workers, prisoners of war, and American farm workers able and willing to travel at their own expense or at the employers' or Government's expense will be needed to supplement short local labor supplies.

The Office of Labor plans in 1945 to supply a somewhat larger number of foreign workers. It expects to have at the peak of the season 105,500 workers available. This number includes Mexicans, Jamaicans and Bahamians. The War Department estimates that there will be about 100,000 prisoners of war available to farmers in acute shortage acres at the harvest peak.

How an OLIVER "Cletrac" helps you in the fight against pests

Don't let insects or parasites rob you of a full crop just because rain and mud prevent you from spraying on those important few days when spraying is really effective.

Mud or tough going can't hold up early spring orchard work when you own an Oliver "Cletrac" *Tru-Traction* Tractor. No need to wait for the ground to dry out. An Oliver "Cletrac" has *extra* traction to take you through the softest spots.

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A limited number of Oliver "Cletrac" *Tru-Traction* Tractors are available for essential agricultural use, ranging from the all-purpose Model HG to the sturdy Model B. Your Oliver "Cletrac" dealer will do his best to get one for you. Ask him to help you file an application. **The OLIVER Corporation,** 400 West Madison Street, Chicago 6, Illinois.

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Before you buy any tractor find out about the year-round versatility of an Oliver "Cletrac," described in this free, illustrated booklet, "365 Days." Just fill in the coupon and mail today. Learn how an Oliver "Cletrac" can help you save money every season of the year.

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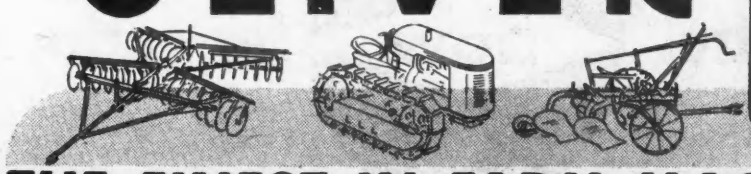

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Top notch growers like the

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Pre-Blossom Stage

"*Mike*" *Sulfur*—microscopically fine, contains more than 95% active sulfur, wets instantly, covers thoroughly, gives superior finish to fruit, gives extra thorough coverage against apple scab and brown rot. *Dow Dry Lime Sulfur* is less caustic than liquid lime sulphur but more caustic than "Mike" sulfur, is easy to handle, dissolves readily in cold water, imparts finish to fruit. *Bordow* is an effective copper fungicide particularly recommended for leaf spots on cherries, prunes and plums. *Dow Arsenate of Lead* is a reliable spray controlling most leaf-eating and chewing insects.

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